

University News

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Mathematics and Biology

D. VENKATESWARLU

Planning and Management of University Departments — Towards a More Dynamic Role

ANUPAMA SHAH, RAMESHWARI PANDYA & BELA PUROHIT

Challenges of Undergraduate Teaching

ATMA RAM

Reading for Pleasure

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2. For the present, B.B.M., B.Com., B.Sc., B.Ed., Diploma in Engg., B.Sc. (Engg.), PGDCSA, M.B.M., M.Com., M.Sc., M.Ed., M.Tech and Ph.D. Courses in the Faculties of Commerce, Education, Engineering, Science and Social Sciences (except for Ph.D. in Psychology) will be open for admission to male students.

3. Admissions are made on the basis of academic merit, written test and personal interview. At present, admissions to M.A., M.Com., M.Sc. and M.Tech. are made on the basis of academic merit and personal interview only.

4. Written test is not an entrance examination open to all candidates who apply, but it is a part of selection procedure. Only a limited number of candidates will be called for written test on the basis of marks obtained in various pre-qualifying and qualifying examinations/qualifying examinations.

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Except for Ph.D., completed applications must reach the Registrar upto 30th June, 1996. In case of B.A./B.B.M./B.Com./B.H.Sc./B.Sc./B.S.Sc./B.Sc Engg./Diploma in Engg., the last date will be 10th day after declaration of result of Intermediate Examination of the U.P. Board for regular candidates or 30th June, 1996 whichever is later. For Ph.D., the last date will be 1st September or 1st March every year

Timings. For Prospectus sale and for submission of completed applications at the Counter: 10.45 a.m. to 2.30 p.m. from 5.6.96

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25.5.96

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Editor :
SUTINDER SINGH

Mathematics and Biology

I.A. Khan*

Mathematics and its applications are awe-inspiring in their scope, variety and depth. Not only is there rapid growth in pure mathematics and its applications to the traditional fields of the physical sciences, engineering and statistics, but also new fields of application have emerged in ecology, geology, genetics, medical sciences and social organizations, etc. The user of mathematics must assimilate subtle new techniques and also learn to handle the great power of the computer efficiently and economically.

Mathematics has proved to be a powerful tool to interact with almost all sciences and it has made a tremendous contribution to Physical Sciences (physics, chemistry, mechanics, etc.), Social Sciences (economics, psychology, sociology, linguistics, etc), Industrial Sciences (stock control, allocation, transportation, sequencing, search theory, dynamic programming, etc), Technological Sciences (information theory, engineering, network theory, control systems, computers, space technology, etc) and Life Sciences (genetics, agriculture, medicine, cybernetics, etc). This applied mathematics has a marvellous role in the success and progress of all modern sciences and technologies.

Mathematics entered the field of life sciences through the medium of mathematical statistics because the nature of basic processes of life sciences is probabilistic. About three centuries ago, mathematics was used in the studies of genetic characteristics in peas. Since then the uses of mathematics gathered momentum in genetics leading to the improvement in breeds of plants and animals. Pearson¹ used the test of significance and sampling distribution for certain applications in biometrics. Fisher² did a lot of work at Rothamsted farm testing the significance of the differences between varieties of wheat by the method of analysis of variance. Moreover, statistical methods, have played a dramatic role over a long period of time in the areas of animal husbandry, industrial quality control, insurance and banking, public health, medicine, psychology and education.

The development of cybernetics began around 1942, after mathematicians McCulloch, Lettvin, Pitts, Dell³ and others noticed that machines and organisms show considerable similarity in both structure and function and that both can be described in terms of systems. Consideration of control mechanism in physiology (the science of functions and phenomena of living beings) first came into the picture in the seventeenth century (Helmont 1660, Descartes 1664) and were published in a more improved and developed form in the 18th century by Seguin and Lavoisier (1789). The theory of control and regulation arose in the 19th century starting with Borgnis in 1818 and it was further worked out by Maxwell⁴ in 1859. Muybridge^{5,6} as a first person, initiated a research program on the movements and gaits natural to most animals, in 1872. He presented the animal locomotion systems

[This work was completed by the author at the International Centre for Theoretical Physics (ICTP), Trieste, Italy under the associateship scheme.]

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making use of legs as the basic component for support and propulsion may be considered from the point of view of finite state machine theory by regarding each leg as an elementary two-state sequential machine. After the discovery of the triode, around the turn of the century, electronic techniques made a rapid development during the next fifty years. Around the mid-forties, all these fields converged with computer techniques and the theory of automata to become cybernetics, supplemented by Shannon communication theory⁷. Cybernetics, in brief, deals with the comparative study of control and communication in both animals and machines. Mathematical methods and techniques are used to develop meaningful analogies between the working of brains and the control computation communication aspects of machines. It is important to mark that the results of Muybridge⁵⁻⁶ were extended in a more general mathematical theory of legged locomotion by Hilderbrand⁸⁻⁹ and McGhee¹⁰. This work helps in controlling the limbs of artificial legged locomotion machines and also it elaborates control principles employed by animals to achieve its coordination in steady gaits.

Neurophysiological models of the brain are constructed and their adequacy is tested by mathematico-deductive methods. Though all physiological and psychological problems are not supposed to be solved by application of mathematics, mathematico-deductive methods have taken an important place besides experimental and clinical studies of neurophysiologists and psychologists. Mathematics helps a biologist in the same way as it helps the electrical engineer to build electronic computers.

A variety of methods exists for stochastic modelling of infectious diseases. Discrete time stochastic models of epidemic spread, based on the chain binomial distribution came into existence first. In the field of genetic studies of finite population under the influence of mutation, migration and selection, first Fisher¹¹⁻¹³ and Wright¹⁴ and later many others¹⁵⁻¹⁹ extensively applied the techniques of diffusion stochastic processes. These efforts in this direction have contributed a great deal of measures to control the epidemics, to cure the infectious diseases and genetic problems and also to improve the gene species.

A method of measuring principal routes of calcium metabolism in man, given by Aubert and Miland²⁰ is based on comparison of the solution to a

certain system of differential equations containing a number of parameters with the observed curve of decreasing radioactivity in the blood. Later on, Parsons²¹ described an entirely different analysis of the system of differential equations, for the same purpose.

Around 1964, a mathematical description of the process of inducible enzyme synthesis was presented by Heinmets²² who set up a complete system of differential equations describing the situation. Later on, this work expanded, as the techniques of quasilinearization and dynamic programming were developed by R.S. Roth and M.M. Roth²³ from Massachusetts. In 1964, W.W.J. Walton submitted his doctoral dissertation at the Johns Hopkins University, Baltimore, Maryland, on *Modern Decision Theory Applied to Medical Diagnosis*. In 1969, scientists at the Medical Institute, Moscow, treated diagnostic process as a control decision stochastic process. This type of mathematical approach led to better medical diagnosis and treatment.

Mathematical research work on the problems of non-Newtonian fluid flow had attracted the attention of biologists due to two mathematical properties of blood flow: (I) blood flow in the human body is non-Newtonian fluid with complicated stress-strain rate equation, and (II) the walls of channels of this blood flow are of varying cross section, curved and elastic. The same feature is also observed in the case of elasticity, fracture and fatigue of bones. H.M. Lieberstein²⁴ used non-linear partial differential equations to quantify the velocity in time-dependent flow of a viscous incompressible fluid in an elastic tube which was intended to represent blood flow in vessels. It is also worthwhile to point out here that two branches of mathematics, elasticity and tribology, proved very useful tools to biologists in the technical field of movements of human body joints.

The electrophysiological investigations of the physiochemical bases of excitation carried out by J.C. Eccles²⁵ and many other physiologists laid the foundation for an accurate quantitative study of the action potential phenomenon. The mathematical interpretation of the biological rules of excitation introduced by P. Lazarev and developed by N. Rashkevsky²⁶ and later on by A. Hodgkin and A. Huxley²⁷, makes it possible to examine quantitatively the process of excitation of a cell, using mathematical methods.

Around the mid-sixties G.G. Koch, University of North Carolina²⁸, presented an algorithm to determine the compatibility of donor-recipient pairs in organ transplantation. Richard Bellman and his colleagues, the Rand Corporation, California²⁹ utilized non-linear differential-difference equations for mathematical theories of cancer chemotherapy and theories of control mechanisms in heart-lung systems. Bellman and Kotkin and their colleagues prepared a mathematical model to know how the concentration of a drug or its by-products build up in parts of the body. This model simulated the time and space distribution of a drug injected into the circulatory system. The mathematical approach (asymptotic expansion) was made in the pseudo-steady state hypothesis of biochemical kinetics (enzyme reactions) in the University of Minnesota³⁰ in the late sixties. The mathematical model of fibrinolysis came into existence to offer the statistical analysis useful in experiments involving drugs with transient effects. The National Health Research Council TNO, the Netherlands³¹ applied a model to data on heartbeat irregularities by using the analysis of expectation density function, probability density function and serial correlation coefficients. Richard Bellman³² posed and discussed the general problem of using classical mathematical concepts and conventional general-purpose digital computers to replicate various activities of the human brain-mind such as memory, pattern recognition, decision making and learning. He also pointed out that the methods of mathematical physics can be used with considerable success to provide understanding of physiological mechanisms in chemotherapy, cardiology, respiratory control, neuro-physiology and in many other areas of medicine.

In the late sixties, the Dartmouth Medical School, New Hampshire³³ described a mathematical model of the passive properties of bladder muscle. The Department of Pharmacology, University of Camerino, Italy³⁴, set up a computer program for the application of a method to locate stereo regular segments in proteins from their amino acid sequences. Gani and Srivastava³⁵ employed the deterministic equations, matrix calculations and stationary distributions to study the loss of ineffectivity of spherical influenza virus due to antibody attachment. H.M. Lieberstein, Wichita State University, Kansas³⁶, studied the significance of viscous flow properties in the theory of operation of Nephron whose agglomeration may approximately characterize a

kidney, by using first order ordinary differential and partial differential equations.

The Canadian Department of Agriculture used mathematical models and techniques for insect control strategy on a nationwide scale. In 1969, the University of Kingston, Ontario³⁷, showed how a simple mono-molecular biokinetic system can be analyzed using the matrix approach. In 1969, the University of California, Los Angeles, applied the mathematical theory of sequential sampling to gamma scanning in nuclear medicine³⁸; utilized the queuing theory in hospital systems regarding surgery cases³⁹; presented a computational method for determining the location and size of tumours⁴⁰; fitted the theoretical differential equations to observe experimental kinetic data in drug metabolism⁴¹; and used modern control theory in optimal drug regimens⁴². In Germany⁴³, differential equations were employed in distribution of oxygen partial pressure in two-dimensional tissue supplied by capillary meshes and concurrent and countercurrent systems. L.B. Zatterberg, Stockholm, Sweden⁴⁴ used a linear difference equation in EEG analysis, applying the notion of vector analysis, matrix theory, integrals, correlation coefficients and numerical analysis. Herman Metzger, Germany⁴⁵ applied the differential equations and respective difference equations describing the course of oxygen partial pressure in capillaries and tissues and he solved these equations by the application of the method of successive over relaxation.

Nagumo, Arimoto and Yoshizawa (Japan), in 1962, proposed a third order partial differential equation for a simplified mathematical model of a nerve fibre along with the excitation propagators. In 1969, at University of Tokyo, Japan, simplified mathematical model of a nerve fibre was described by a semilinear partial differential equation. P.P. Schmidt, University of Georgia, Athens⁴⁶, used the generalized Liouville partial differential equation in his study of the theory of message transport in nerves. It resulted in a suggestion for fundamental message charge transfer step.

In 1970, at the Neurosensory Laboratory, Pittsburgh, Pennsylvania, T.W. Barrett⁴⁷ made holography and information theory applicable to a description of the physical stimulus for visual perception and the cerebral cortex. It provided the analysis of visual and auditory systems.

In 1971, Richard Bellman, Los Angeles, Califor-

nia⁴⁸ discussed the asymptotic behaviour of linear differential difference equations for topics in pharmaco-kinetics and applied linear differential equations in some novel types of control processes arising in the study of optimal drug administration. The department of Nephrology and Mechanics, Haifa, Israel⁴⁹, used a mathematical model for dynamics of dialysis and urea clearance and optical flow rates were calculated as a function of treatment conditions. The integral equations were applied by Mode C.J. Drexel University, Philadelphia, Pennsylvania⁵⁰, in context of age-dependent branching processes, using a modern version of the Fredholm theory in Hilbert space.

In the mid-seventies, in the Department of Zoology, North Carolina State University, Raleigh⁵¹, the behaviour of a simple aquatic ecosystem with algae, bacteria, daphnia, detritus and usable dissolved organic carbon as its components, was studied using random differential equation models. These models lead to make prediction in terms of means and associated variances and thus are more useful than deterministic models, for applied problems in ecology and resource management.

The Centre of Mathematical Statistics, the Institute of Neurology and Psychiatry; and the Institute of Hydrotechnical Studies and Researches, Bucharest, Romania⁵² studied the hemodynamic mechanism of cerebral hemorrhage, using the mathematical methods of fluid mechanics. This work demonstrated the analogy between yielding of blood vessels and that of pressure pipes.

Mathematical models have been designed to simulate reality and to find optimal methods of administering drugs and medical treatment. It enables predictions to be made of cell permeability and reaction rates of between drug and cellular enzyme molecules. Optimal estimation techniques have been applied to measure blood perfusion in the heart in order to detect and assess coronary diseases and myocardial infarctions, in the University of Texas, Health Science Centre, Dallas and Southern Methodist University, Dallas⁵³. Researchers at Texas A&M University, Texas⁵⁴ applied the Walsh functions and Hadamard matrices for computer-assisted signal processing of EEG data. Fourier analysis also has proved very helpful in signal processing of EEG data.

In the beginning of the eighties, D.D. Do, California Institute of Technology, California and P.F.

Greenfield, University of Queensland, Australia⁵⁵, developed an approximate analytical technique employing a finite integral transform to solve the reaction diffusion problem with Michaelis-Menton Kinetics in a solid of general shape. Such problems arise in the formulation of substrate and product material balances for enzymes immobilized within particles, in the description of substrate transport into microbial cells, in membrane transport, in the transfer of oxygen to respiring tissue, and in the analysis of some artificial Kidney systems. Mathematical analysis of carbon dioxide transport by blood was represented at Lehigh University in Bethlehem, Pennsylvania⁵⁶. This work created a basis for more complex physiological problems, such as transient responses following an occlusion.

Professor H. Vogel, Germany⁵⁷ and J.N. Ridley, South Africa⁵⁸ presented mathematical models for sunflower heads, for the better production and better packing of its seeds.

In 1983, International Conference on Mathematics in Biology and Medicine was held in Bari, Italy. The conference objective was to bring together scientists in pure mathematics, biology and medicine in order to exchange ideas on the formulation, solution and analysis of mathematical models related to biological issues. The conference proved a grand success, where seventy research papers were presented on *population genetics and ecology* (Literature concerned with the issues such as the dynamics of age structured cell populations and Volterra type predator-prey models), *epidemics* (Mathematical models of infectious diseases, such as hepatitis B and measles; pros and cons of rubella (vaccination), *resources management* (Bayesian methods in resource management and the use of stochastic differential equations in fishery management), *physiology and medicine* (Mathematical models useful for interpreting physiological or biochemical data), *compartmental analysis* (Mathematical models useful for analysis of staging and age-dependent stochastic systems), and *general mathematical methods* (research papers discussing parameter identification for partial differential equation models and stability analysis of differential delay models).

Compartmental analysis is useful in the study of epidemiology, drug kinetics, lipoprotein kinetics, chemical reaction kinetics, metabolic systems, ecosystems and other systems. In compartmental analysis, the dynamic system is separated into a finite

number of component parts, called compartments, and flow between compartments is described by ordinary differential equations usually arising from mass-balance considerations.

In the mid-eighties, at Israel, the Institute of Technology, Haifa⁵⁹, a mathematical method was developed for evaluating the distribution of blood pressure, stresses and strains of the muscle fibres, and motion of the cardiac wall due to the cyclic contraction of the heart. A porous-medium approach was used to model heart mechanics which assists to evaluate strains and blood flow distribution in the cavities and ventricular wall.

In recent past, since the first cases of AIDS (acquired immuno deficiency syndrome) were reported, many mathematical models for predicting the spread of the epidemic have been proposed, including Hyman and Stanley, Los Alamos National Laboratory, New Mexico⁶⁰ who used deterministic model. Isham V. discussed mathematical modelling of the transmission dynamics of HIV (human immunodeficiency virus) infection and AIDS. Applying the mathematical and statistical devices, researchers at the Harvard School of Public Health, Boston, Massachusetts, developed a discrete-time stochastic model which generalized a chain binomial model with application to HIV infection. Deterministic models of epidemic spread are tractable mathematically and computationally, while stochastic models are advantageous in order to obtain estimates of variability for the predictions of the number of new infections.

The manufacture of artificial limbs (prosthesis) has been enriched by mathematical techniques which improve the quality to a suitable state which fulfils the basic life requirements of disabled persons. Mathematical equations have always played a very important role in all the major chemical species of intracellular and extracellular components of the blood including plasma and hemoglobin and in the partial pressures of all the gases in air space. So, one may easily predict the state of a pilot's blood as he goes to higher altitudes.

Recently, orthogonal polynomials have been connected to birth and death processes which are special stationary Markov processes. Birth and death processes have applications to a variety of fields including nuclear physics, spin glass, chemical reactions, population dynamics, genetic models, etc.

It is noteworthy that biologists have employed the exponential distribution in radiotherapy; stochastic processes in bacteriology; partial differential equations in the spread of epidemics; glucose concentration time curve in the blood during continuous injection of glucose; mathematical models in circulatory system (heart problems), vision, excitation and pulse waves; diffusion in metabolising system, bull's eye cardiography, etc. Bayes's theorem (probability theory) is used in medical diagnosis to find the probability that a patient has a certain disease. The matrix theory is applied in medical dieting distribution in hospitals. The category theory and topology is applicable in rational biology and biological systems. In the context of population biology and chemical kinetics, the theory of ordinary differential equations, discrete maps, continuous and discrete delay equations, phase plane analysis and partial differential equations are generally used to form molecular and population models. The more recent work of Schaffer and Kot and others have explored the possible implications of chaos on experimental population. Phase resetting and properties of oscillator topology such as "black holes" have been applied very recently in circadian rhythm, neural stimulated response, the cardiac pacemaker and sudden cardiac death.

The collaboration of mathematics and biology has provided a large number of instances of mutual enrichment. A classic example is the case of reaction diffusion systems which motivated the search for biological morphogens and mathematical discoveries about the behaviour of partial differential equations of this type. Other examples include oscillating biochemical reactions and the topology of limit cycles, neural action potential and excitable dynamics, coupled oscillators and phenomena of cardiac wave arrhythmias, chaos and physiological diseases, etc.

Mathematical biology has established itself as a subject whose identity is difficult to delineate or to undermine. Its scope has ranged from data analysis, to existence theorems; from large scale computer simulations of physiological systems to an obsession with Lotka-Volterra equations; and from quests for chaos in fluctuating populations to semi-groups, circle maps, dynamics on n -dimensional tori and other exotic themes of modern mathematics.

The education pattern in which mathematicians have no knowledge of biology and biologists are unaware of the nature of mathematics, is undesirable in this modern age.

Both the different realms of mathematics and biology must be united in order to understand mutual problems and to think over their mutual strategies and line of actions. This is the high demand of the time that bio-mathematicians, bio-statisticians and mathematical biologists, having the knowledge of both the subjects, are to be produced for the cause of the public welfare in the world.


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Planning and Management of University Departments Towards a More Dynamic Role

D. Venkateswarlu*

Universities are said to be torch-bearers of higher education. The winds of knowledge should blow strong and loud there. The society at large should reap the benefits of the knowledge turned out by the universities as they are the locales of the latter. It is with this view that the universities have been made autonomous as only an independent mind can think freely and fearlessly, and be creative.

A university functions through its various departments which are ultimately its units. Therefore the standing and fame of a university depends on the competence and effectiveness of the departments. Hence, how a department is managed and the role of the Head of the Department (H.O.D.) assume significance.

This paper is aimed at a critical evaluation of the role presently played by a department and the problems that are usually encountered, and suggestions/recommendations for a more dynamic role for the departments. The experiences of the functioning of the departments and heading a department in Sri Venkateswara University serve as the background for this paper.

The role of the department and that of the Head of the Department are intrinsic and hence the two are combined here. The activities currently undertaken by a department broadly fall under two categories, namely, academic and administrative.

Academic

1. It is the department that basically plans a course through the Board of Studies and, after approval by the Academic Senate, implements the course.
2. It is the department that conducts the admissions for P.G. and M.Phil/Ph.D. courses after the candidates are cleared through the entrance examinations.
3. The classwork is coordinated by the Head of

the Department.

4. The research guidance for both M.Phil and Ph.D. is carried out in the department but it is mainly a 'student-to-supervisor' activity. The Head of the Department merely prepares the syllabus for the common paper in M.Phil course.

Administrative

1. Both the teaching and non-teaching staff function mostly within the realm of the department and under the overall authority of the Head of the Department.
2. The Head of the Department is the sanctioning authority of the casual leave of the staff and he forwards to the higher authorities applications for any other leave.
3. The Departmental Council, Development and Planning Committee, Departmental Research Committee, Library Committee decide on issues and matters beyond the purview of the Head of the Department, but they are not basically policy-making bodies and decide on issues on which there are already university provided guidelines.

A Critical Evaluation

In the present set up, the departments are mere units totally dependent on the system (university) for all matters with no freedom of choice in planning and action.

They receive circulars and instructions to be implemented. Very rarely, they are involved in policy making in the university.

Such a passive role naturally results in 'no accountability' for the departments and 'passing on the buck' principle operates perfectly in the university system. The departments are sometimes involved only when there is a crisis in the college/university.

Although the Board of Studies formulates a course, it comprises only senior faculty from the department. More often than not, the proposals of

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introducing a new course or dropping an old one are sometimes approved in the Board of Studies without the knowledge of the other teachers of the department.

As for the service matters, many a time teachers apply for leave without prior notice and sometimes after availing of the same or skip classes on some pretext or other. The Head of the Department is expected to overlook such problems as 'it happens in other departments too and there the Heads of the Department are keeping quiet, so why are you alone bothered?'

The interpersonal problems between the staff on the campus appear to be mostly ego-based. If the senior professor has been a teacher or a guide to one, then any eccentricities are tolerated and if the Head of the Department happens to be a peer, then the question of ego comes. He is not expected to demand explanation even for blatant acts of indiscipline.

Suggestions

The role of the departments can be made more dynamic and active; they should be involved in policy formulation — right from the beginning and in its execution.

To manage and coordinate different activities in a department, a 3 or 5 member committee may be constituted. That alone should take all the policy decisions at the departmental level and on any issues referred by the university. The committee also should be accountable for the course structure, internal discipline, academic standards and all other matters of the department.

At present, it is taking inordinately long time of nearly 2 years for any changes in the courses to come into effect. The Departmental Committees may be empowered to effect any changes within a short notice. They should also be entrusted with the examination and evaluation processes to reduce the several delays in the announcement of results.

To promote a better student-teacher rapport, regular meetings of the student leaders and the college authorities must be held. At present this is done only when there is a problem or a crisis. Frequent meetings may help reduce tensions and solve many a minor irritant before they assume serious proportions.

The departments get a very raw deal in respect

of allocations of budgetary resources to develop any infrastructure. Year after year, there is a steady increase in the strength of the faculty and research scholars but without a corresponding growth of infrastructural facilities. It is a pity to see a staff room shared by 2, 3 or 4 or even more disturbing each other to their own utter helplessness. Therefore, it should be made mandatory that budgetary allocations should be made to improve the infrastructural facilities like additional accommodation, furniture, type-writers, etc, and their expenditure a clear function of the department concerned.

As the Departmental Committees will be responsible for academic standards, they may organise seminars, conferences or workshops to promote continuous academic activities. The competence, participation and stimulation of the faculty stand to benefit from such exercises.

The research courses like M.Phil and Ph.D. presently pursued are not rigorous. There can be such inputs as seminars, tutorials, etc. Such exercises will not only make the research students wiser and brighter but also instil in them a feeling of confidence to write the National Test or when they appear for interviews.

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"QUALITY IN TOTO IS OUR MOTTO"

Challenges of Undergraduate Teaching

Anupama Shah*
Rameshwari Pandya**
Bela Purohit**

Introduction

The undergraduate system constitutes the predominant part i.e. 80% of the higher education system in our country. Despite this, the fact remains that the system in our country has not been able to accomplish the goals of higher education. It has been commented by several educationists and academicians that though the number of higher education institutions have increased by leaps and bounds, the quantitative expansion has been accompanied by qualitative deterioration.

Indira Gandhi had rightly said the nation's well being depends on teachers' well being. Our two million teachers are the custodians of our future so the success of any educational program depends to a large extent on teachers. A contented and motivated teacher is certainly an asset to any educational institute. A good educational system should be dynamic, flexible and discriminating enough to help the teachers. One of the most important reforms needed in higher education is to improve teaching. In such a creative work like teaching provision of stimulating conditions of work and adequate opportunities for advancement are extremely important and the teachers do expect them. The conditions of work need to be such as to enable the teachers to function at their highest level of efficiency. This would imply provision of certain minimum facilities in the classroom, essential teaching aids, library and laboratory facilities, etc. It would also imply a system which encourages initiative and creativity and gives adequate freedom to the teachers in organization of their courses, the type of extra curricular work, and the type of evaluation. Inadequacies in teaching profession defeat the purpose of education and gradually destroy the interest and enthusiasm of teachers for sincere and honest work. The Education (Kothari) Commission (1966) therefore suggested that nothing is more important than providing teachers with best professional preparation and satisfactory conditions in which they can be fully effective. Keeping the above justification in mind a study was carried out to survey the satisfac-

tion and inadequacies of the undergraduate teachers in the Faculty of Home Science, Baroda, 1995.

Objectives

1. To study the satisfaction of undergraduate Home Science teachers.
2. To study the inadequacies faced by the undergraduate teachers.

Methodology

In order to determine the satisfaction as well as the inadequacies felt by the undergraduate Home Science teachers, a questionnaire was developed.

Selection of the Population

The selected population consisted of 50 Home Science teachers teaching the undergraduate courses in the Faculty of Home Science.

Sample

The sample consisted of 42 undergraduate teachers, out of total 50 undergraduate teachers teaching Home Science. Eight teachers were either too busy or were on leave so the total sample was of 42 undergraduate teachers.

Data Collection

The questionnaires were personally given to the teachers in the month of September 1995. The subjects were assured that they would not be identified, as names were not required while filling out the questionnaire.

Analysis of Data

The data were statistically analysed by using frequencies and percentages.

Findings and Discussion

The findings are presented under two headings:

1. Satisfaction, and 2. Inadequacies.

1. Satisfaction of College Teaching

On the basis of the collected information from 42 undergraduate Home Science teachers it is found that there is consensus amongst the college teachers about the job satisfaction as they feel it does offer a great amount of social status and opportunities to have contacts with outside agencies. They also feel it is a stimulating profession and there is a great scope for development of skill in organising extra curricular activities. There are also great opportunities for teachers to grow professionally and personally. Teachers still feel it is the noblest of all

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professions and offers a very conducive work atmosphere. It is good to notice that monetary benefit is not the only criterion to satisfy all the teachers.

Table 1. Percentage Distribution of Undergraduate Teachers According to the Satisfaction of College Teaching

| N = 42 | | |
|---------|---|-----|
| Sr. No. | Item | % |
| 1. | Offers social status | 100 |
| 2. | Contact with young and enthusiastic group of students | 100 |
| 3. | Stimulating profession | 93 |
| 4. | Development of skill in organising debate, seminar discussion | 93 |
| 5. | Opportunities for : | |
| | (a) Professional development | 93 |
| | (b) Creative enhancement | 88 |
| | (c) Personal development | 86 |
| | (d) Experimentation | 74 |
| 6. | Decent surroundings | 71 |
| 7. | Nobles of all the professions | 67 |
| 8. | Offers variety of social contacts | 67 |
| 9. | Offers good monetary benefits | 62 |

2. Inadequacies

Majority of the Home Science teachers are facing the problems of resources in terms of electricity, classroom and furniture facilities. The teachers are overloaded due to the lengthy administrative procedures. They feel interrupted due to too many holidays.

Table 2. Percentage Distribution of the Inadequacies Felt by the Undergraduate Home Science Teachers

| N = 42 | | |
|----------------|---|----|
| Sr. No. | Item | % |
| 1. | Lack of electricity | 95 |
| 2. | Insufficient number of chairs and tables for students | 86 |
| 3. | No provision for using teaching aids | 83 |
| 4. | Very dirty classroom | 71 |
| 5. | Too much noise of fans/lights | 64 |
| 6. | Too much of outside noise | 64 |
| 7. | Insufficient equipments in the laboratory | 60 |
| 8. | No provision for chalks/dusters | 55 |
| (B) Time Table | | |
| N = 42 | | |
| 1. | Overload of teachers due to administration | 86 |

| | | |
|----|--|----|
| 2. | Interruption due to too many holidays | 79 |
| 3. | Less time for completion of course due to very frequent holidays | 79 |
| 4. | More workload at the end of semester | 60 |
| 5. | Too much time in extra curricular work | 48 |
| 6. | Continuous periods | 45 |
| 7. | Insufficient time for preparation for teaching | 38 |

(C) Resources

| | | |
|----|--|----|
| 1. | Lack of facilities in canteen for teachers | 93 |
| 2. | No provision for xeroxing and cyclostyling | 88 |
| 3. | Limited funds to purchase commercial teaching aids | 88 |
| 4. | Lack of Indian books and research reports | 69 |
| 5. | Inadequate furniture in the teachers' cabin | 67 |
| 6. | Lack of independent cabins for teachers | 62 |
| 7. | Difficulty in getting books from the library | 62 |
| 8. | Unable to stay for long hours due to lack of | |
| | Food facilities | 55 |
| | Rest rooms | 52 |
| | Phone facilities | 45 |
| | Toilet facilities | 26 |

It has come up in the findings very clearly that students' indiscipline is a major cause for concern to the teachers. Majority of the teachers reported noise in the corridors during the classroom teaching hours as a major area of indiscipline among students.

Other major causes which disturb the undergraduate teachers are the classroom set-up itself especially writing on the desk and disturbing chairs and other classroom arrangements, lack of discipline, absenteeism, and throwing garbage around the classes. Late submission of assignments, less or practically no attention in the classroom teaching causes disturbances to the teachers. Few teachers feel upset due to the back biting which is done by the students.

Motivation means providing incentives or arousing interest in students to learn quickly and effectively. Due to the variations in students needs and interest, they need to be motivated to learn. This is the most crucial task for the teachers to perform while teaching.

Table 3 shows that the teachers have a consensus on two major issues related to the students being demotivated. One is low level of English comprehension and the second one being that semester

system gives a very short time period for imparting in-depth subject matter knowledge.

The teachers have a very little time to get interested in life situations of the students because of large classroom size. Similar findings were reported by Pandit (1979). Teachers had problems in teaching planning for a variety of learning experiences, evaluating students work providing for individual differences, and managing time. The teachers teaching graduate level had more diffused courses to teach with lesser time to large classes with limited facilities and administrative restrictions. This leaves hardly any scope and time for motivation.

There is also a thinking amongst the teachers that the students do not want to do any independent thinking and they also have insufficient background knowledge.

However, the teachers do feel that they do not have much difficulty with bright students.

As regards the problem of freedom of work many researches have been done in this field and it has been found that there are some problems of faculty members which gave them dissatisfaction.

Table 3. Percentage Distribution of the Different Problems as Felt by the Undergraduate Home Science Teachers

| Sr. No. | Item | % |
|--|--|----|
| (A) Discipline Among the Students N = 42 | | |
| 1. | Students make loud noise in the corridors | 88 |
| 2. | Spoiling the writing desk | 88 |
| 3. | Disturbing the classroom arrangement | 74 |
| 4. | Lack of discipline in the students | 64 |
| 5. | Absenteeism in test/submission | 62 |
| 6. | Throwing the waste in corridors/classrooms | 60 |
| 7. | Late comers in the class | 60 |
| 8. | Irregularity in attendance in theory and practical classes | 57 |
| 9. | Late submission of practical assignments | 43 |
| 10. | Less attentive students | 29 |
| 11. | Back-biting of teachers | 29 |
| (B) Motivation Among the Students N = 42 | | |
| 1. | Having low level of students — Englishwise | 78 |
| 2. | Deep knowledge of subject matter | |

| | | |
|---|--|----|
| | cannot be given because of small semester duration | 78 |
| 3. | Students not used to do independent thinking | 71 |
| 4. | Insufficient background knowledge of students | 62 |
| 5. | Making slow learners feel they also have a place in the class by helping them to learn at their speed | 59 |
| 6. | Students not interested in studies | 55 |
| 7. | Finding out motivational techniques | 52 |
| 8. | Difficulty in involving the whole class in learning processes | 45 |
| 9. | Having low level of students — abilitywise | 38 |
| 10. | Difficulty in adapting languages to the level of students understanding | 36 |
| 11. | Difficulty in finding real needs of the students | 31 |
| 12. | Difficulty in making lessons for bright students | 29 |
| (C) Freedom of Work for the Teachers N = 42 | | |
| 1. | Lengthy administrative procedures — availing equipment and contingency grant | 76 |
| 2. | Doing clerical work as checking the records of repeaters | 76 |
| 3. | Lack of clerical assistance in doing teaching job effectively | 71 |
| 4. | Difficulty in getting work done from the office personnel | 71 |
| 5. | Doing clerical work as making copies of record cards | 67 |
| 6. | Collecting grades of repeaters | 67 |
| 7. | Freedom to criticize administrative policy at staff meetings called by higher authorities | 52 |
| 8. | Lengthy administrative procedures hinder the smooth and timely availability of material needed for the practical classes e.g. repair of sewing machine | 45 |
| 9. | Buying of equipments, etc | 40 |
| 10. | T.A. and T.L. are given courses without giving sufficient time for preparation | 40 |
| 11. | Teachers have to teach subjects given to them despite no aptitude and ability | 36 |
| 12. | Pressure of attending seminars and conferences during the academic session and due to this the quality of teaching suffers | 29 |

When a teacher is dissatisfied with academic profession, facilities available, the creative activities may be negligible or none at all. As the table depicts, the majority of teachers have difficulty in

availing the equipment and grants due to very lengthy administrative procedure.

The teachers also get demotivated because they have to undertake lot of clerical and mechanical task like filling the grades and making copies of grade sheets. Similar findings were reported by Goyal 1980 where irrespective of type of college, age, teaching experience of the teacher, they reported "lot of clerical work" and too many teaching and other non-teaching assistance, as most severely felt problems.

Brar (1984) suggested that certain measures regarding the policies and practices, consideration on the part of the heads of departments would also help enhance job satisfaction of Home Science college teachers.

The teachers also get demotivated because they have to undertake lot of clerical and mechanical task besides teachers also get disturbed because the equipments and materials are not available when needed.

Problems related to evaluation are reported in Table 4. Evaluation of the students progress is one of the most essential tasks confronting teachers, parents and students. The most important task of a teacher is to ascertain how much a student has accomplished during a course of studies. Teachers have to work throughout the year due to the two-third weightage attached to the classwork. Students expect direct questions and teachers find it difficult supervising the examinations due to large size of the group as one supervisor is not enough for the group. Problems of correction and tabulation of examination results are also felt by the undergraduate teachers as depicted in Table 4.

Table 4. Percentage Distribution of the Different Problems Related to Evaluation as Felt by the Undergraduate Home Science Teachers

| Sr. No. | Item | % |
|---------|---|---------------|
| (A) | <i>Evaluation</i> | <i>N = 42</i> |
| 1. | Students expect direct questions rather than application type | 60 |
| 2. | Difficulty in getting the paper typed/cyclostyled | 60 |
| 3. | Less acceptance of new methods of evaluation by the students (Assignment, presentation) | 38 |

| | | |
|-----|---|---------------|
| 4. | Limited time for construction of the test papers | 36 |
| (B) | <i>Supervision (Problems due to large size of the group)</i> | <i>N = 42</i> |
| 1. | Small size of the classroom | 76 |
| 2. | Proper supervision of objective test not possible | 74 |
| 3. | One supervisor not enough for the group | 69 |
| (C) | <i>Correction</i> | <i>N = 42</i> |
| 1. | Irrelevant answers | 79 |
| 2. | Improper style of writing answers | 74 |
| 3. | Limited time for correction | 60 |
| 4. | Handwritings of the students not legible | 57 |
| 5. | Difficulty in explaining the conversion of test scores into the grades to the student | 24 |
| (D) | <i>Tabulation</i> | <i>N = 42</i> |
| 1. | Very laborious work | 64 |
| 2. | Difficulty in locating the grades of repeaters | 57 |
| 3. | Limited time for tabulation work of semester examinations | 55 |

In short, these findings provide enough evidence to draw the attention of authorities to the problems of Home Science teachers and make possible efforts to enhance the Home Science teachers' job satisfaction.

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Reading for Pleasure

Atma Ram*

It is somewhat difficult to do justice to three kinds of jobs: looking after or advising the huge State education department, doing one's own reading, and writing. However during the last two years I attempted a bit of all the three activities. While I strove to activate (14 odd branches of) the directorate and to put in inputs on all aspects of higher education at conceptual, supervisory and technical levels, I could spare sufficient time and energy for my writing and sojourn into the realms of gold.

Besides many articles, I edited two books, wrote two more (sent Mss. of still two more to press): *National Policy on Education. An Overview* (1994), *Jab Mein Likhta Hun* (1994) (*when I write*, 1994 in Hindi), *Anand to Atma—Letters of Mulk Raj Anand* (1995), and *Education for Development* (1995). Similarly, I also read scores of books during the period. My pet formula was : office work in the office, and own reading and writing at home. Despite the seasonal deluge of files and flood of time-consuming meetings, it worked fairly well, beyond my expectations at times.

I read what I wanted to; I read for my own pleasure or benefit. As I had not to teach or guide research, it was really a situation of as you like it (with due deference to Shakespeare). My favourite reading extended to such areas: books on general awareness, creative and critical writing, value education, and spirituality. Among books on elementary information I liked reading *General Awareness* (1994) by B. Annadurai, Aditnagar College Tiruruchchendur. The book is based on the syllabus for general awareness of Manonmaniam Sundaranar University, and is also meant for candidates appearing in competitive examinations. Now several books on general knowledge are available, but many of these are too cumbersome or medley of undigestable, unupdated material. This book presents very readable matter for the youth on twelve topics: general science, numerical ability, history of India, freedom movement, Geography, India and

World, Indian Constitution, Economics and sports. One feels that such publications in paperbacks should be made easily available because in almost all competitions, as also in life, general awareness is most essential.

In the second group of good books, I may mention the following: Kedar Nath Sharma's *The Whiff* (1991), Wisdom Books, Dharamsala, HP; P.C. Prem's *Rainbow at Midnight* (a novel, 1994) Writers Workshop, Calcutta; *Contemporary Indian English Poetry from Himachal*, ed. P.C.K. Prem, Konark, 1992; Kulwant Singh Gill's anthology of poems titled *Pasionate Pilgrim*, Writers Workshop, 1994; and a splendid collection of critical essays in honour of Prof S. Viswanathan, *A way of leaving so as to stay*, T.R. Publications, 1994.

The Whiff, Kedar Nath Sharma's second book of poems, the first being *Song of life* (1989), contains 129 original poems, (thirteen illustrated) grouped in seven broad-based categories—a whiff from Himachal Pradesh, predicaments, vicissitudes, the spark, love, democrat, and for children. Sharma writes with astounding ease and understanding on day-to-day incidents. His poems, though often subjective, simple and short, embody fine ideas in compelling images and pictorial descriptions. He speaks out direct, spontaneously and naturally what he feels or perceives. Down deep it is the poetry that stirs and moves. In 'The Winter too is over,' for example, the inherent pathos of situation is touchingly implied:

"So this winter too is over
and certainly
the spring is catching on.
Now all trees will bloom
except the human one
which has shed one leaf more,
off-itself".

Such lines remind one of poems like 'Ode to the West Wind' by P.B. Shelley, 'Happy Insensibilities' by John Kents, and a famous couplet by Kabir, the saint-poet. Indeed, Sharma's reflections and recollections are interesting and thought provoking. At times his seemingly straight statements contain very

*Set 50 Type 4, Kasumpti, Shimla-9 (HP)

meaningful observations. To give an example:

*"Sometimes liveliness invokes dullness,
and dullness invigorates.
Often honesty becomes a liability
and dishonesty is called success".*

He describes with great vigour several landscapes in Himachal Pradesh in the first section. The landscapes and the feelings/ideas they arouse naturally mix and mingle so as to impart an organic whole. Thus poems such as 'The lighting God' (Bijili Mahadev), 'At the Rohtang Pass', 'Kangra Hills', 'At the Neigal' (Palampur), have their own charm and fascination. In fact, Kedar Nath Sharmas's poetry ever moves and thrills, compelling one to think and reflect. It shakes, pricks, delights and lifts. One can safely conclude with Rajiv Gandhi, a former Prime Minister of India who wrote to the poet on 20 June 1990, about his poem 'I am a Machiavellian Prince' (included in *The Whiff*): "It was indeed most interesting"

P.C.K. Prem is another writer from Himachal who caught my attention. The author of over 20 excellent books of poems and fiction in English and Hindi, he is an enthusiastic administrator turned creative writer. All along, his endeavour is to probe the inner psyche of his characters and resolve the mystery of life. A serious literary artist with a commendable flair for handling the narrative. His *Enigmas of Identity* (1990) contains poems wherein he strives to "push ugliness into reality," whereas *Shadows at Dawn* (1991) includes stories with hidden implications. In *Contemporary Indian English Poetry from Himachal*, he introduces, with a telling introduction, eleven poets of Himachal Pradesh. In his first novel, *The Dying Embers* (1992), he penetrates into the web of human relationships.

Rainbow at Midnight (A Novel) is a new type of work with the slice of modern life as its main base. Here Prem's narrative skill is at its best. The novel highlights, through fictitious yet living characters and situations, evil forces, corruption, sexual harassment, and cruelty inherent in the socio-political life-pattern. It is a story of an honest officer, Amba, posted in a sub-division. On the very first day, he meets senior citizens of the town, who are well-educated, sophisticated but hypocrites. These citizens seem to run the State, for they claim high connections. Politicians, businessmen, orchardists—all

form a formidable group to weaken the very fabric of a system claiming a bit of morality. Amba confronts all these strong components of the narrow system. Very small and negligible problems and issues, which harm the interests of such influential persons, are magnified. Amba discovers exploitation of women in this network. Alok and Bater symbolise high connections and rampant corruption. A minister's son, Ripu, wants Rita to submit to his evil designs. She naturally revolts, but only Amba stands by her. The evil has its sway.

In the end, Rita is attacked and made to suffer. There is an orchestrated assault on Amba. Without using State's police force, he is able to contain the agitation. He sadly comments: "We have saved lives. You can build a house but you cannot make a man". But influential people manage to get Amba suspended, his seniors could not help him. However, looking at his suspension orders, he feels pity. His wife emphatically remarks, "why compromise on principles.... who would correct this massively cruel system?"

Although beginnings and endings are most troublesome for writers, this is not the case with Prem. He starts a story as naturally as leaves come to a tree. He then deftly weaves a network of relationships, making for the realistic delineation of characters. The novel has many characters, around fifty in number, but they are all living, none becoming a shadowy figure. Situations and characters conceived are so real and life-like that the author has to assert: "This novel is a work of pure fiction.... Any resemblance to actual events, locales or persons, living or dead, is entirely coincidental." His dialogues are natural and meaningful, and descriptions are social and significant. Each chapter marks a stage in the story and forms an organic whole. The novelist writes with great ease and grace. This is how the 38-chapter novel ends :

"They made this world and lived here. He was one of them he thought. He looked behind, there was no trace of the car. Old memories had sped away. He looked at Radhika and laughed. The echo of his laughter chased away his sadness and he continued walking home."

P.C.K. Prem deals with the present day world, its problems and dilemmas, fears and aspirations. He tries to unravel the mystery of life, to "look into the

life of things." His fertile imagination and mature craftsmanship enable him to manage complex situations and a vast spectrum of life. The very titles of his works indicate this tendency. Storms, Rainbows, Horizons, Dying Embers, Enigmas, Shadows, and Dawns figure there frequently. Himself in the lineage of the nationally known Raja Sansar Chand Katoh, Prem is the only important novelist in English in Himachal Pradesh.

In terms of emotional content and poetic viewpoint, P.C.K. Prem's writing merits elaborate and broad-based scrutiny. Those who look for depth and meaning in Indian English literature, should turn to this literary artist of the hills. They will not be disappointed. He presents a bright specimen of involved writing. As he once admitted in an interview: "Writing for me is an experience for a moment, and everything comes out of deeply felt situational analysis of human intellect and heart."

In *Contemporary Indian English Poetry from Himachal*, the editor introduces nine major English poets from the tiny hill State: D.C. Chambial, Krishan Gopal, M.K. Kaw, Lajpat Nagpal, S.C. Prashar, Hetty Prim, Som P. Ranchan, Kedar Nath Sharma, Lalit Mohan Sharma, and P.C.K. Prem. The book comprises two parts: part A contains a commentary on English poetry in Himachal, and part B carries poems by nine representative authors. These sections supplement each other, and impart a considerable cohesiveness to the work. Prem offers very cogent criticism of modern poetry in the Pradesh, and the "pieces" he selects for inclusion are both significant and representative.

The editor follows a systematic and logical approach. In the first part, he sketches the contemporary scenario and objectively assesses the poets. I think the section on criticism is much more interesting and useful. One agrees with PCK Prem when he concludes with absolute candour: "Himachal English poetry appears to have attained maturity and it communicates freely with the national stream....This poetry shows social and political awareness, religious and traditional influences which constantly work out an ethos to connect it with the national poetic consciousness, and therein lies its major strength."

Moving down the majestic hills, snow-clad peaks and enticing valleys, I chanced upon a poet

embodying the Punjab consciousness in its variety and depth—Kulwant Singh Gill, the author of *Passionate Pilgrim*. It is his third "collection" of poems, the earlier being *Scattered Beads* (1984), and *Beyond and Spectrum* (1990). *Passionate Pilgrim* has 60 short poems on diverse themes. Gill's poems are short yet gripping, terse and telling. He often begins with ordinary details or observations, then steadily builds up his theme and moves to a plausible conclusion. For instance, in 'Creation' he dwells on the charms of the creation, and finally remarks:

*"If creation is so wonderful
How wonderful would be
The Master Maker in all His might!"*

In 'Punjab Mata' he sincerely comments on what a brother has done to a brother:

*"Your sons—
The hunter and the hunted
Lie mangled in gory dust
For they heeded not your silvery hair
Held not each other in trust".*

Mr. Gill's is, indeed, the poetry of ideas informed by deep emotions.

In the realm of criticism, I greatly enjoyed reading *A way of leaving so as to stay*, ably edited by teachers of University of Hyderabad—Sudhakar Marathe, Mohan Ramanan, P. Sailaja, M. Sridhar, and Alladi Uma. These are perceptive papers written by discerning scholars on various literary issues falling in four major areas—Shakespeare, poets like Hopkins, Shelley, Eliot, post modernism and culture, and Indian literature. Here the contributors delve deep, and bring to bear primary and secondary sources to establish their viewpoints. R.A. Foakes, for example, concentrates on the storm in Othello's mind from the textual evidence. Kenneth Muir examines Shakespeare's pre-eminence from various angles in 'Abiding Our Question'. M. Kumara Swamy Raju studies Shelley's translations, whereas C.R. Visweswara Rao provides a worthwhile perspective on Eliot's idea of culture.

It is not a routine type of festschrift where a teacher is generally praised in superlatives by those who sought and received favours when the "big" man occupied the chair. No, certainly not. Prof. S. Viswanathan is no doubt a very competent supervisor and known professor of English. The book does

not include details of his biography; only, and very aptly, a complete list of his publications has been provided towards the end. These papers by the scholar colleagues of Viswanathan finely "attempt to reflect a variety of his interests." That in itself is a very glowing and befitting tribute to the great academician.

Academicians and educators from top to bottom have often two things in common: teaching of their subjects/disciplines, and inculcating, through example, in their pupils certain values in human behaviour and conduct. The latter is now popularly known as value education or value-oriented education or more appropriately, education in human values. I came across several books on education, but the Sai Ram pattern impressed me most for two reasons: they fall back upon India's cultural heritage, and make their teachers and students practise these virtues daily. *Education in Human Values* (Sri Sathya Sai Books, Prashanti Nilayam, 1988) provides a glimpse of these values and the way these are taught or caught. The material of the book is taken from discourses given by Bhagwan Sri Sathya Sai Baba, and is compiled by Loraine Burrows. The book has eight sections—the aim of education, the role of the teachers, the duty of a student, the ideal of womanhood, advice to children, parents' responsibility, Sai spiritual education, and quotations. It provides very exhaustive guidelines for teachers, parents and students; the book may serve as a guiding light to all those who are involved in the teaching profession.

The publication is interesting on two counts. First, the matter is at once original and inspiring, the motivating and guiding force behind it being the Baba Himself. It is also thorough in approach and treatment, as duties of all concerned with value education or right type of education have been clearly (and lovingly) spelled out. Second, human values have been invariably related to spiritual virtues and selfless service. At Prashanti Nilayam, as in all Sai Ram institutions, these are also followed in letter and spirit. I had the good luck to visit that seat of enlightenment and remain there for over a week. One is impressed by what is being done there. The Sai pattern of education is an enviable and practical model of imparting instructions.

Many of the quotations are spoken sentences of

the Baba and work like powerful *mantras*. At Prashanti Nilayam one finds them inscribed here, there and everywhere. To cite a few examples: "The father, the mother and the teacher are the three, primarily responsible for moulding the future of a country;" "The universe is a great university;" "Education must promote peace, security and happiness." To teachers, his advice is: "Do not think that your service to children is for their sake. It is equally so for your sake." To students, he exhorts: "It is the duty of every human being to understand and respect his parents." How should children grow up? Says the Swami: "Children must grow up in the atmosphere of reverence, devotion, mutual service and cooperation....in the awareness of the brotherhood of man and the Fatherhood of God."

It is a very fruitful and rewarding experience to study in person Sai Ram institutes of learning—schools, colleges and the prestigious university.

Translations of religious books reveal to us what is available in other Indian languages and point to the similarities or varieties of India's spiritual wealth. I found this motif elaborately dealt with in publications brought out in various languages by Radha Soami Satsang Beas, Dera Baba Jaimal Singh (Amritsar). The Dera has published about seventy books written by the sages of Agra and Beas (Swami Ji Maharaj, Baba Jaimal Singh, Huzur Maharaj Sawan Singh, Sardar Bahadur Maharaj Jagat Singh, Maharaj Charan Singh) and devotees and scholars. (Maharaj Gurinder Singh is the present living saint at Beas). I studied a number *Santmat* books issued by the Dera, and the following two influenced me most: *The Path* (1969, 18th rpt. 1994), and *Die to Live* (1979, 3rd rpt. 1983), both by Maharaj Charan Singh. Here he explains the *Santmat*, the Path to realise God as adopted by all saints and sages of all times.

The Path is a free translation of the Punjabi original, *Sant Marg*, done by K.L. Khanna, late Secretary of the Dera. It describes "the ancient wisdom that has come to mankind ever since the world was made and which remains its sole hope of release and salvation". What precisely is this ancient wisdom? It comprises three eternal principles/concepts: the Word or Sound Current, present in all human beings; the (living) Master who is competent to connect our consciousness (soul) with the sound current or Word or *Shabd*; and the Divine Grace which enables one to have the above-mentioned process

actualised. This is the path—the only way to realise the Creator. The book expounds it through the study of specific themes and evidences from the texts of numerous sages and saints, such as Kabir, Guru Nanak, Paltu, Darya, Tulsidas, Tulsi Sahib, Farid, Charandas, Bulleh Shah, Guru Amar Das, Guru Arjun Dev, Bhikha Sahib, Mira Bai, Namdev, Guru Ram Das, Ravi Das, Sahjo Bai, Rumi, Hafiz, Sheikh Sadi, and so on.

Its sub-topics, therefore, include the law of *Karma*, the soul and the lord, the state of the world, the one Lord, castes and creeds, the Lord is within, the barrier of ego, the true name, *simran* and *dhyan*, the inner path, the company of saints, the Master and the Lord, the true Master, true worship, the lure of the world, the purpose of life, the grace of the Lord, and the message of saints. It is a very adequate translation from the Punjabi version (I have seen the original), and appears like an original writing in English. Even quotations from various religious books have been very accurately rendered. To give an example :

*"Sugar, honey and buffalow's milk are all sweet,
But incomparable is the sweetness of the Lord."*

(Sheikh Farid)

Die to Live succinctly describes, in question-answer form, what meditation is and how the devotee should go about it. It is based on the answers Maharaj Charan Singh gave to foreign devotees in the evening meetings held at International Guest Hostel at the Dera (in India) for over a decade. It is brought into the book form by Arnold Howard of the States. The subject matter is, again, *Santmat* or the Path. The crux of the eternal philosophy is made clear. God is in and behind all the creation. He is inside us, not outside. He can be realised while living, with the grace of a perfect, living Master who connects our soul (consciousness) with the Divine Consciousness, Word or Logos or *Nam*. All saints preach and practise this, and enable others to follow the Path. Here in 378 Question-Answers, the Path is delineated. There is given a comprehensive introduction to teachings of the saints. Then, questions are grouped according to themes or areas of enquiry : the divine design, essential pre-requisites, adjusting our way of life, concentration, dying while living, *simran*, *dhyan*, *bhajan*, inner guidance, living in the meditation atmosphere, growing in love and devotion, be bold enough to struggle, progress is inevitable, and love is His gift from within.

The volume retains in ample measure the freshness and spontaneity of actual conversations as also the profundity and lucidity with which the Master speaks eternal truths in ordinary language. For seekers, it is a valuable guidance book; for meditation it is a dependable compendium of everlasting wisdom and light.

These two books essentially deal with the same theme. For the *Dera* books, the print orders often run into thousands and then into lacs. These are very nominally priced because the purpose is to reach the seekers. These are also important since the philosophy is made crystal clear in a direct, illustrative and persuasive way. The Master often speaks in first person plural—always respectfully and politely. Candour, sweetness, love and humility are His forte. Then, each book (or *satsang* for that matter) is self-contained, comprehensive, complete in itself. These books are characterised by clarity of thought, simplicity of expression and charm of presentation. Various saints are frequently quoted to illustrate the viewpoint.

Here the stress is invariably on the need of a living Master, and practice of *Nam*. It is not a mere theory or a matter of hearsay. Saints speak of what they have experienced and enable others to do the same. Says Dadu Sahib:

*"With his own eyes has Dadu seen
What he is speaking of;
As for others, the words they utter
Are only hearsay."*

Similarly, Tulsi Sahib observes:

*"Tulsi has seen
With his own inner eye;
And as he has seen,
So has he described."*

And Christ avers:

*"I say unto thee, we speak that
We do know, and testify
that we have seen."*

John 3:11

(Quoted in *The Path*, P. 145)

I feel like reading these books again and again, as they seem to contain material which should be "chewed and digested", to be made a part and parcel of one's life and daily activities.

Education and Social Change

Mr. Justice P B Sawant, Chairman, Press Council of India, delivered the Convocation Address at the fourth convocation of the North Maharashtra University, Jalgaon. He said, "Just as this country is eclipsed by corruption and the corresponding offences, similarly it has been punctured by communalism, casteism, regionalism and linguistic differences. The unity and integrity of the country is in danger. This is a result of mental immaturity. Meanmindedness results in intolerance, while mental immaturity results in meanmindedness. Education must broaden the intellect and the mind." Excerpts

Wisdom and practical approach along with knowledge is necessary for the success in life. Hence, it is rightly said "experience is the best teacher". Knowledge can be acquired even without going to any educational institution, but experience cannot be earned without actually living the life.

Whatever field you choose in leading the life, constant acquisition of knowledge shall be necessary to succeed in that field. Knowledge has no limits and is constantly added to. In the present age, knowledge is growing in geometric progression. You can face the competition in life only if the knowledge is upto date. Knowledge earned in the educational institution, is not the entire knowledge of the subject. It only shows the direction. Knowledge to succeed in a particular field is to be acquired by following that direction. For that you have to be a student throughout your life.

Life is an endless struggle. In fact, life was brought into being after a struggle with natural progress. Creation is a result of struggle. The charm of life lies in struggle. A life without struggle is paralytic, pale and tame. Hence, struggle should not be looked upon as a calamity, but as

a test of one's ability. It is necessary to undergo so many such tests in life — small or big. Active life cannot be led by being afraid of struggles or avoiding them. Those who wish to do something worthy in life and to add to the progress and good of the society must face the struggle and treat it as an opportunity. More the struggle, more the success. That is real education which teaches to overcome all small or big calamities in life. Hence, education never ends. Life is a school and all of us are students in it right upto the end.

The knowledge, which we acquire, should be conducive to the uplift of the society. No action of ours should be in conflict with the interest of the society. It should protect the interest of the society while achieving personal progress. Our actions must be morally satisfactory and this satisfaction is had only if we do something for others. Howsoever great we may be that does not bring in real satisfaction. The real pleasure springs from sacrifice. This can be done in private or public life; while doing any small or big work in any field, by young or old. But, for that, we must change our attitude.

Knowledge can be used for social uplift or its destruction. De-

structive tendency is on the increase at present in the world. On one hand, increasingly terrible weapons are being produced for the annihilation of nature and man; harmful things and drugs are produced; dangerous technology is being spread — while on the other hand, more and more ingenious means are being invented to exploit the society. And this is being done by the educated. Many among them are experts in their respective fields. Sharp intellect and expertise in a particular subject is also misused in exploiting the society. Knowledge is like fire. Fire can be used for cooking, but also for burning a house. Hence, spread of knowledge does not culminate in social progress. Human and social values must be inculcated along with the spread of knowledge. Corruption is scarce in the illiterate, it is the monopoly of the educated! Misappropriation, bribery, forgery, bank scams, havalas, rackets, foreign exchange frauds, tax evasion, black money — these offences are the gift of the educated to the society. The financial health of the society is affected by such offences only which leads to an instability in the society. Murder, dacoity, burglary have continued from the beginning of human life. Till these offences do not go beyond control, there is no instability in the society. Their effects are limited and restricted to individuals. But the financial offences, which only the educated can do, destroy the texture of the society. Increase in the offences of the educated, is a matter of grave concern for the society.

Just as the destructive use of knowledge is a blot to education, similarly the intellectual and mental slavery of the educated, their orthodox nature, blind be-

liefs and otherwise dependence are equally despising. These prove the education to be useless and are its insult. The purpose of education is to teach a man to think independently, but mental slavery proves that the purpose has been vitiated. This may be a fault of education or indicative of the education being futile. Scholarship does not mean reading a heap of books. There are hundreds of so-called scholars who are intellectually and mentally paralytic in spite of reading many books. He who cannot think independently and add to the knowledge of society or cannot help in leading it in its intellectual progress, does not deserve to be called learned. He is simply bookish. He is neither a philosophic thinker nor a foreseer. What the society needs is a thinker, a leader and a foreseer and not slaves carrying a load of books, or prattling crammers. It is necessary for the progress of the society that education produces foreseeing thinkers. So you must first be mentally and intellectually independent. Then only you will be able to use properly the education you have acquired; you will be helpful to the good of the society. You are expected to lead the society. Mental and intellectual slavery takes back the society by many years.

Just as this country is eclipsed by corruption and the corresponding offences, similarly it has been punctured by communalism, casteism, regionalism and linguistic differences. The unity and integrity of the country is in danger. This is a result of mental immaturity. Meanmindedness results in intolerance, while mental immaturity results in meanmindedness. Education must

broaden the intellect and the mind. But, the education that is imparted results in both these being contracted. So mere spread of knowledge won't do. The purpose of education should be to widen the horizon of mind and intellect. But, at some places this was intentionally obstructed and it is still so. Unfortunately the fact is not recognised by many. So the mental slavery of the past centuries shall continue and the country will naturally have to suffer. Special attempt must be made to change this situation. This is expected of your modern rational generation.

Most of the intellectuals in our country, except a few, are believing in tradition or blindly imitate the westerners. Both are intellectual slaves. Nothing need be said about traditionalists. Those following the westerners blindly have led the people on a wrong path and are doing so. To be drifted with the wave is the permanent nature of these intellectuals. When the Leftists had sunshine days, they were the participants of the fair. When the fair was over, many of them had sealed lips. Some of them are loudly praising the liberal financial policy. This is a sign of immaturity. This does not mean that opinions should not change. But, this shows that opinions accepted in the beginning are not rationally tested. Intellectual slaves cannot free a society. These so-called intellectuals feeding on the west have misguided the common man. If this situation is to be changed, a path of the progress of this country is to be identified, intellectuals capable of thinking independently are needed. The new generation should fill this gap.

70% population of this country depends on agriculture and 75% lives in rural area. But the condition, needs and aspirations of the rural area are rarely considered while deciding the economic, political, social policies of the country, making legislation, interpreting it or executing it. The main reason is that the voice of the representatives of the rural people is heard in important institutions as an exception. The legislators from the rural section have to combat with the supporters of the representatives in urban area, industrialists, businessmen, and agents and the urban bureaucrats. People are too innocent for the strategy of these. Again rural representatives, for some reasons, forget rural interests after going there. Hence, the development of this country is by the path of the welfare of the urban area, people, and rural institutes are sacrificed. The representatives of the rural area are practically none in judiciary. So some decisions of the Supreme Court and High Courts are far from the truth and adversely affect the interests of the rural people. If this is to be altered all the small or big institutes in the country must bear the stamp of the elite, honest leadership for the rural area. Your University is truly considered as a rural University. So the responsibility of creating rural leadership naturally falls upon you. The students passing out of this University have a binding to lead the rural interests at national and international levels in various fields.

Intellect is not a monopoly of any one, nor educational standard a monopoly of any region or educational institution. The standard of the skill of the students taking education in an education-

nal institute does not depend upon the place where the institute is situated. It depends upon the quality of the teachers and the students taught, along with their efforts. So the rural students should not have an inferiority complex while comparing themselves with the urban students. On the contrary, the education which the rural student gets in the soil and which is required by the country, does not exist with the urban students. Hence, the depth and quality of the education of rural students is wanting in urban ones.

This does not mean that there is no variation in the quality of the education imparted by various educational institutions. Undoubtedly, there is a difference between the quality of education imparted in Zilha Parishad or Municipal Schools and private schools. Similarly, there is a difference in quality of education in Schools for the common man and those for, the elite high society. Again the schools with the misleading name 'Public School' which are in fact reserved for the very high society make the disparity in education all the more sharp. Unfortunately, Navodaya Schools started in every district with the lead by the Government, are, more or less, in fact going to be helpful to retain 'Public School' culture. The disparity in education being increased with the leadership of the Government and at the cost of public money is not a thing of which any Government can be proud of. There also, such an act being done by a Government which is bound by Constitution to create social equality, is objectionable legally also. The education being imparted in the Navodaya Schools should be given in all schools. Giving such an education by starting special

schools for the students in the guise of quality is unconstitutional. A separate group of high society is formed by Government's blessing. This is against the philosophy of democracy and socialism. The intellect and the inborn qualities of all do not blossom in the same age. Many-a-time, there is rise and fall even in the maturity of intellect. Hence, running special institutes for the students after seeding out students showing intellectual brilliance in a particular subject in a particular age, is not acceptable even to science of education. It is beneficial to inspire such students by giving them scholarships at the particular time. Not that all students are able to continue the scholarship right upto the end. Similarly, those not successful in getting it at one time may not be unsuccessful next time. Making a special class of those who have shown merit on one occasion and running special schools for special education for them leads to inequality, disparity, and inferiority complex in the society.

In this context, it is necessary to scrutinize impartially the scheme of free education to all. It is an absolute truth that giving equal concession to all in a society having economic disparity increases the inequality. In our country, disparity has always been in existence. It is increasing day by day and it has reached its apex today. 60% of all the expenses on education is on higher education, 25% goes to secondary education and 15% on primary education. This means that 15% expenditure on 85% population and 85% for 15%. This inverse ratio of expenditure also shows how our school problems are thought of from the viewpoint of the sophisticated. It will also be clear how this class has the lion's share of

the national income. The expenses of the education for primary to higher education given in Govt./Semi Govt. or aided institutions is incurred from people's money. The fee charged is nominal. The fee charged in primary to higher education varies inversely with the expenses. So spending people's money for the education of those who can afford to pay the fees is neither proper nor judicious. This cuts across the principles and provisions of the constitution. Just, as it is against the principle of equality to give different treatment to those at par, giving equal treatment to those not at par means sacrificing the principle of equality. On the contrary, charging fees according to the slab of income is necessary for the proper execution of the constitution. Society spends money for the education of all. Everyone must contribute his mite. It is also improper to differentiate between men and women in this matter. Presuming that women of the financially higher strata do not get education because of financial dependence is a distortion of truth. The question how much money of the Govt is likely to be saved by differentiating between the rich and poor in charging fees?" is irrelevant. The question is of equality and constitutional provision therefor. People's money should be spent for only those who need it. Such needy persons are more in rural area. The responsibility of getting changed the unconstitutional and unjust policies lies more on those who want to bring the Constitution into effect honestly and over those educated of the have not class of the society who have got the eye of knowledge after getting the education. I also express an expectation that they will fulfil this responsibility.

Audio Visual Media in Distance Education

The Commonwealth Educational Media Centre for Asia (CEMCA), in collaboration with IGNOU, conducted a 3-day Orientation Programme for the Directors of Institutes of Correspondence Courses (CCIs) of Indian Universities and Open Schools on Audio Visual Media in Distance Education at the ICSSR regional centre, Osmania University, Hyderabad.

The inaugural session was presided by Prof V S Prasad, Director, Distance Education Council and Sri Kiran Karnik delivered the keynote address. The Heads of the Educational Media Centres in Hyderabad (AVRC, EMRC, CIEFL, Ambedkar Open University) and the Mass Communication & Journalism Department, Osmania University were present. Prof. Manzurul Amin, Retd. Addl. Director General, Doordarshan, also graced the occasion.

Mr. K. Narayanan, Head, Administration & Finance, CEMCA, welcomed the participants and explained the objectives and activities of the Commonwealth of Learning (COL) and the Commonwealth Educational Media Centre for Asia (CEMCA). He stressed the need for co-operation amongst the Asian institutions in the area of educational media. Prof Prasad, in his presidential remarks, felt that the CCIs should incorporate audio-visual media in some of the courses gradually and in this effort they could use the existing facilities available with IGNOU, AVRCs/EMRCs of the UGC. Sri

Kiran Karnik, Vice-President, Discovery Channel, in his keynote address visualised that education was emerging as the biggest industry in the years to come and the CCIs should gear up to meet the challenges from commercial organisations. The Distance Education institutions should bind their resources and make effective use of the electronic media in imparting high quality education to students. Mr K. Ravi Kanth, Programme Officer, CEMCA, who was also the co-ordinator for the programme, provided the context for it drawing upon the recommendations of UGC's round table meeting of the Directors of CCIs of Oct '95 and a needs assessment survey of CEMCA. He introduced to the participants the objectives, the methodology and the resource persons of the programme. The objectives being: 1) to map out the roles and applications of audio/visual media in distance education, 2) to facilitate experience-sharing in the production and use of a/v media, and 3) to facilitate a dialogue between the Directors of CCIs/Open Schools and the Heads of the major educational media organisations.

After intense deliberations spread over eleven sessions that included presentations by CIEFL, Consortium for Educational Communication, IGNOU, and AIR, the following recommendations were made :

RECOMMENDATIONS

i) Relating to the CCIs

a) There should be a firm com-

mitment at the higher level within the CCIs for the use of audio/visual media in distance education. The CCIs should prepare time-bound action plans, which should identify the courses where a/v media could be integrated, suggest the media choices and media combinations and indicate the strategy for implementation and evaluation. At the implementation stage, an existing staff member of the CCI could take on the role of a media co-ordinator with the responsibility of actualising the action plans. He/She has to do an inventory of the available a/v materials and try and integrate them into the correspondence courses identified for the purpose, giving due consideration to pedagogic, economic, administrative and learner centred factors. The assistance of CEMCA, EMPC and DEC could be sought at this stage, if necessary.

b) The production of a limited number of all programmes could be taken up initially on a 'cost-sharing' basis by the CCIs (as a collective body) in subject areas, which are common to all. The assistance of EMPC/AVRCs/EMRCs may be sought in the actual production stages. The resulting programmes may be dubbed into regional languages with appropriate alterations for use by CCIs as distance learning material.

c) The CCIs are to explore new ways of delivering a/v learning materials to their students. This calls for an innovative and

enterprising attitude. The experience of the CCI at Nagarjuna University in trying to reach out to its students through the Cable TV Channel should provide some cues to the other CCIs.

d) As the capital costs for establishing an electronic media production centre may be too high for any single CCI to absorb, it was suggested by some participants that autonomous media co-operatives be established, regionwise, and financially supported by the respective CCIs. Part of the seed money for these Centres may be sought as grant/assistance from DEC, UGC, industry and other sources. The facilities and services of these Centres could be used to produce/dub the necessary a/v programmes.

e) Though some of the CCIs may be working under financial constraints, they still have human resources to contribute. Good teachers/educators could be identified by the CCIs from their academic staff for the purpose of writing scripts for IGNOU/CEC audio/video programmes. The services of hard working (as a TV programme requires at least 60 hours of preparatory time) academics, who can provide new insights/ ideas, could certainly be utilised for the production of distance learning materials.

f) The CCIs could provide basic information to EMPC/CEMCA/CEC on their courses so as to facilitate an understanding of the nature of a/v support required.

ii) **Relating to Indira Gandhi National Open University**

1) *Electronic Media Production Centre*

a) Advance information on IGNOU's a/v programmes to be provided to the CCIs so that inputs may come from the academic staff of the CCIs in the formative stages.

b) IGNOU to produce a 'showreel' of its a/v programmes, subjectwise, so that the CCIs would be able to preview the material more easily.

c) IGNOU's catalogues of a/v programmes and broadcast schedules to be mailed regularly to all the CCIs.

d) CCIs are to be assisted by IGNOU in the production of their audio/video programmes — advice on planning, producing and utilising the programmes.

e) EMPC to make available duplication facilities (for audio & video) and other technical services to the CCIs on a 'cost-recovery' basis.

f) IGNOU to undertake joint productions of a/v programmes with the CCIs in subject areas of common interest.

g) EMPC to help CCIs install the necessary hardware to receive the IGNOU telecasts and downlink the teleconferencing transmissions.

2) *Distance Education Council*

a) to act as a co-ordinating body for monitoring and providing a/v production & playback facilities in Distance Education institutions.

b) to formulate appropriate pol-

icies to co-ordinate all national agencies — IGNOU, State Open Universities, CCIs, in the utilisation of a/v materials.

c) to provide funds to CCIs for:

- (1) developing and using electronic media materials,
- (2) procuring relevant audio/video programmes produced by other institutions,
- (3) training initiatives related to production and use of electronic media in distance education,
- (4) acquiring the hardware and downlink facilities to access the IGNOU teleconferencing facility, and
- (5) establishing regional media co-operatives, whose services and facilities would be used by the respective CCIs,

d) to facilitate the sharing of the audio/video resources available within the distance education institutions in India (IGNOU, State OUs etc).

e) to facilitate access to the technical facilities/services of state Open Universities for the CCIs to produce their a/v materials.

iii) **Relating to CEMCA**

a) CEMCA in collaboration with DEC should act as a co-ordinating body for all the CCIs in this initiative of integrating a/v media into correspondence courses.

b) CEMCA in collaboration with DEC could provide value-added information to the CCIs on the available audio/visual learning materials. This service would help CCIs identify and procure the a/v

programmes compatible with their courses and relevant to the needs of their students.

c) CEMCA, in collaboration with IGNOU, UGC and the different educational media centres, could organise training programmes for the academics in CCLs and provide professional support to help CCLs produce and use electronic media materials.

d) CEMCA, in collaboration with DEC, could facilitate collaborative production endeavours between CCLs and educational media/broadcasting organisations in the country.

iv) **Relating to University Grants Commission**

a) UGC should provide matching grants (*along with DEC*) for

1) the purchase of a/v materials by CCLs for integration into their courses,

2) the production of a/v programmes at the educational media centres of UGC, EMPC,

3) the acquisition and installation of the necessary hardware to access the tele-conferencing facility of IGNOU/ISRO,

4) training programmes (organised jointly by CEC/CEMCA/IGNOU) related to the production and use of electronic media in distance education, and

5) establishing regional media co-operatives, whose services and facilities would be utilised by the respective CCLs.

b) UGC, in consultation with Consortium for Educational

Communication, may evolve norms and specific guidelines for the use of the technical and production services of the EMRCs/AVRCs by CCLs for the production of their a/v programmes.

v) **Relating to CEC and EMRCs/AVRCs**

a) EMRCs/AVRCs may provide advice and extend technical facilities and services to the CCLs for the production of their a/v programmes.

b) EMRCs/AVRCs may undertake joint productions with the CCLs (which are located within the same region) in subject areas of common interest.

c) EMRCs/AVRCs may conduct training programmes (in collaboration with CEMCA and IGNOU) for the academic staff of the CCLs in the production and use of electronic media materials for distance education.

vi) **Relating to All India Radio**

a) AIR should provide 'airtime' to the CCLs in the different regions of the country for at least one hour a week.

b) AIR should make available to the CCLs some of its technical facilities for the production of their educational radio/audio programmes.

c) AIR should initiate and facilitate the interactive use of radio by the CCLs, at timings, which are convenient to the students.

vii) **Relating to the sales of a/v programmes**

a) An exhaustive catalogue con-

taining information on all the a/v programmes (under different subject headings) of IGNOU, CEC, CIET etc. should be mailed periodically to all the CCLs by the marketing agencies — CEMCA and DEC to facilitate this.

b) The price lists of the educational programmes should be approved by the actual producing organisations (i.e. IGNOU, CEC, CIET). This makes it easier for the CCLs to process the quotations and purchase the cassettes.

c) The CCLs may be allowed to make payment within one month of the supply of the audio/video cassettes and submission of bills by the marketing agencies.

Legal Aid Hospital

A new concept in legal education has been introduced in Lucknow University. The new multi-purpose course meant for students of five year LL.B. (Hons.) Course would not only make them specialists in different branches of Law but will also give them specialised training in management and accountancy.

For the benefit of LL.B. (Hons.) students a "Legal Aid Hospital" has been opened with all the required facilities including forensic laboratory, finger print bureau, hand writing bureau and post-mortem facilities.

The legal aid hospital would deal with taxation, rent control, consumer protection, family matters, service matters, accidents claims, human rights violation, drug addicts and drug trafficking etc. It would embrace all branches including civil, criminal and

revenue to provide practical training to students of five year course.

On completion of five year course 15 students would be selected in order of merit to work as resident lawyers, on the pattern of resident doctors. They will work for three years and then vacate for new incumbents. These resident lawyers will provide socio-economic justice to the poor and needy persons by giving them legal advice and necessary legal aid. Legal aid camps would be organised in rural areas where both legal education and legal aid will be given to villagers.

The state govt. have also approved a grant of Rs. 25 lacs for the establishment of "Legal Aid Hospital".

PG Diploma in Human Rights

The National Law School of India University, Bangalore, has decided to offer a one year Post-graduate Diploma in Human Rights Law and Practice through distance education mode from July 1996. The course is a part of the University's efforts to widely disseminate legal knowledge with a view to supporting human rights observance, rule of law and good governance.

The course is designed to provide a basic understanding of the human rights guaranteed to every person in international law and in domestic laws. It also seeks to inform the public as to how one can secure his or her rights through various bodies within one's country and outside. The medium of instruction and examination will be English and working knowledge of English is essential for participating in the

course. Those holding a University degree in Arts, Science, Commerce, Law and Humanities from any of the recognized universities are eligible for admission to the course. There is no restriction as to age, nationality or sex and the course is open to employed persons as well.

Further details may be obtained from the Distance Education Department, National Law School of India University, Nagarbhavi, Bangalore-560 072.

Rajiv Gandhi University of Health Sciences

The Rajiv Gandhi University of Health Sciences constituted to ensure proper and systematic teaching, training and research in modern and Indian systems of medicine has started functioning in Bangalore from June 1 with Dr. S. Kantha as its first vice-chancellor.

The appointment of Dr Kantha to head the university for a period of three years was approved by Governor Khurshed Alam Khan recently. According to the Rajiv Gandhi University of Health Sciences Act passed in September 1994 the first vice-chancellor will be appointed by the chancellor (governor) on the recommendation of the government.

About 260 medical, dental, pharmacy, nursing colleges and Indian systems of medicine institutes will be affiliated to the university. The university, the third in the country after Tamil Nadu and Andhra Pradesh, will also look after post-graduate admissions of medical and dental courses, which is now being done by the director of medical education.

The university which was

earlier proposed to be located in Mysore was shifted to Bangalore as most of the professional colleges were in Bangalore. The university will function from Sanjay Gandhi Institute of Accident Relief and Physical Medicine which has moved to its own building near NIMHANS.

AEB Annual Session

The 17th Annual Session of the Academy of Environmental Biology is proposed to be held at Rohtak from 16th-18th November, 1996. A symposium & BRPM competition on "Environmental Management of semi arid tropics with special reference to developing rural areas" will be organised during the session. A Theme discussion on "Science & Technology — its role & utilisation in Ecosystem health" is also planned. The BRPM Competition is held to promote, encourage and reward the young talented scientists of the country.

The topics proposed to be discussed at the technical sessions of the symposium include Biodiversity, Case studies—Impact assessment and Environmental health, Toxicology—animals, plants and men, Waste utilization and recycling, Conservation of Natural resources, Environmental biotechnology, and Impact of hazardous chemicals on the ecosystem.

Further details may be had from Dr. R.C. Dalela, Secretary (HQ), The Academy of Environmental Biology, 771, Civil Lines (South), Muzaffarnagar-251 001 (India).

New Initiatives at GNDU

The Guru Nanak Dev University proposes to establish an Institute of Mass Communication with all modern facilities and equip-

ment at Jalandhar. This was announced by Mr. B.K. Srivastava, Vice-Chancellor of the University while addressing the media persons at the University Campus in Amritsar recently. He said the institute would be run by an autonomous society and the Board of Directors of the Institute would include eminent personalities from various walks of life including the print and electronic media.

Mr. Srivastava said a committee had been constituted to look into the problems facing the rural students in respect of style and pattern of question papers for Entrance Tests conducted by the university for admission to various courses. The university had also framed a board-based policy for the appointment of Coordinators for Entrance Tests. Under this policy Deans of faculties would be appointed as Coordinators of various entrance tests.

He said efforts were being made to associate experts of NIEPA and other institutions like UGC, CSIR, AICTE to bring improvement in management of the university and colleges. He said a system was being evolved for evaluation of individual teachers as also of the teaching departments by using standard parameters developed by national and international institutions. This system, he said, would be used for encouraging the outstanding teachers/departments by providing additional grants for research and bring in a sense of motivation amongst the teaching faculty.

The Vice-Chancellor said that the university had decided to set up a development cell to help in the development of colleges in general and rural colleges in particular. This extension work

would be undertaken to help the rural teachers and students in making them more suitable and competent to pursue higher studies vis-a-vis the urban students. The university, he said, would also adopt some rural colleges for closer interaction and development.

To prepare the students for competitive examinations, a Centre for providing General Knowledge and General Awareness was also being set up with the help of some private institutes of national repute, Mr. Srivastava said.

Research Grants in International Relations

Under a grant from the Ford Foundation, the American Studies Research Centre (ASRC) has announced a new series of research/study grants to research scholars and college and university teachers in the field of international relations (broadly defined). These short duration grants, (at the junior, middle and senior levels) are designed to enable the eligible researchers and teachers to utilise the resources

available at the Centre and are designed to cover travel costs and boarding and lodging charges in the Centre's hostel.

Further details and application forms may be obtained from Dr. B. Ramesh Babu, American Studies Research Centre, Hyderabad-500 007.

AEB Awards

The Academy of Environmental Biology (AEB) has announced Awards for 1995. These include:

(1) Archana Medal; and (2) DEF Medallation in Toxicology (11th Young Scientist Award).

Nominations are invited from members of AEB and through Heads of Universities/IIT's, Research Institutes, Institutions & Learned Societies for the above Awards.

For further details and proforma of Nomination Forms, write to Dr. R.C. Dalela, Secretary (HW), The Academy of Environmental Biology, 771, Civil Lines (South), Muzaffarnagar-251 001, India.

News from Agricultural Universities

ICAR Summer Institutes

The Indian Council of Agricultural Research (ICAR) has decided to hold 33 Summer Institutes/Short Courses in the field of Agricultural Sciences and allied subjects during the summer vacation of 1996 for the benefit of teachers, research workers and extension workers, particularly the subject-matter specialists. The main objectives of this inservice training course would be to communicate the latest technologies/

advances in the subject and provide the necessary orientation to teachers and research workers of Agriculture/Agricultural Engineering/Animal Sciences/Fisheries so that they are able to relate the teaching of their subject to the problem in their respective disciplines.

One or two teachers, researchers and extension specialists from a University/College/

Institute/Department, who are actively engaged in teaching research or extension education in the respective subject may be sponsored.

The sponsored candidates should not be over 45 years of age on 1st July, 1996 and should have Master's degree in the respective discipline and working at the lev-

el of Asstt. Professor/Scientist with two years experience in the respective discipline.

Details of the candidates may be furnished in the prescribed form (available with the University/Institute) to the Director of the Summer Institute at the respective university so as to reach him fifteen days before the commencement of the course.

sions on the proposals in consultation with the State Governments/Universities/State Boards of Technical Education and, therefore, it is desirable for the Societies/Institutions to make proposals in line with the manpower requirements in different areas as projected by the respective State. The Directorates of Technical Education/State Governments shall be consulted in this regard.

The Council shall encourage the setting up of new institutions in the States which are otherwise deficient in outturn of technical manpower. The Council shall be stringent in approving the proposals from the States which already have more than the adequate manpower.

The Council considers the optimum intake capacity for a multifaculty Engineering Institution as 400 to 420 and for the Polytechnic as 300.

News from AICTE

New Proposals for Academic Year 1996-97

All India Council for Technical Education (AICTE), has framed regulations regarding grant of approval for starting new technical institutions, for introduction of courses or programmes and for increase in the intake capacity of the courses or programmes in consultation with the agencies concerned, namely, State Governments, University Grants Commission, Universities or State Boards of Technical Education, etc.

Incomplete proposals shall not be considered and the proposals received after the last date notified shall be considered for academic year 1997-98.

Copies of the proposal are required to be sent simultaneously to the respective State Government and to the affiliating Universities/State Boards of Technical Education. The evidence to this effect shall be furnished alongwith the proposals made to the Council at the time of submission.

To simplify the procedure, it has been decided that the proposals for starting of new courses within the approved intake capacity and any adjustment in the existing courses within this capac-

ity shall be submitted to the respective Regional Office of the AICTE. Proposals for new institutions and additional intake due to new courses and increase in intake, etc. shall be submitted to All India Council for Technical Education.

The Council will take deci-

News from UGC

Countrywide Classroom Programme

Between 16th June to 23th June, 1996 the following schedule of telecast on higher education through INSAT-ID under the auspices of the University Grants Commission will be observed. The programme is presented in two sets of one hour duration each every day from 6.00 a.m. to 7.00 a.m. and 1.00 p.m. to 2.00 p.m. The programme is available on the TV Network throughout the country.

1st Transmission

6.00 a.m. to 7.00 a.m

16.6.96

"Rabindra Sangeet-Part I"
"Blooming Thorns"
"The Week Ahead"

18.6.96

"Communication: Television A Window on the World"
"The Glorious Legacy of the Marathas of Thanjavur - Part I"
"Colour of Skin or Colour of Mind"

20.6.96

"Electromagnetic Pollution"
"Innovation in Teacher Education"
"Speak the Speech—Part I"

22.6.96

"Origin of Geometry"
"Income Tax - An Introduction"
"Sonic Litter"

23.6.96

"Rabindra Sangeet - Part 2"
"Lasting Impressions"
"The Week Ahead"

Ind Transmission

1.00 p.m. to 2.00 p.m

16.6.96

No Telecast

17.6.96

"The Week Ahead"

"Question Time"

"Concept of Colour—Part II:
The Eye's Music"

18.6.96

"Radioactivity—Part I"

"Count Abilities... Not Dis-
abilities"

"Thyroid—The Quiet Work-
shop"

19.6.96

"Fibre Materials and Fabri-
cation—Part 2"

"Heritage of Thanjavur -
Saraswati Mahal"

"Fungal Wealth of India"

20.6.96

"Geo: Deserts"

"Musical Imageries in Tagore
Literature"

21.6.96

"Sun-Earth Space Environ-
ment—Part I: Solar, Wind
and its Effects on Earth"

"Dusk at Dawn"

"Necessary Evil-Nickel"

22.6.96

"Cockroaches"

"Creative World of Make-up"

"Kathak"

23.6.96

"No Telecast"

Hindi Telecast

प्रातः 6.00 से 6.30 बजे तक

17.6.96

"पोलियो"

"आधुनिक चूल्हा— स्त्रियों के लिये
वरदान"

19.6.96

1. "भित्ति चित्रों में कृष्ण शेखावती"
2. "सामूहिक विवाह"

21.6.96

"ई. एम. आर. सी. की अंग्रेजी
फिल्म — विन्सेट वॉन गो"

"चन्द चित्र बालिका के"

environmental chemistry: its role in school and undergraduate curricula; chemistry and biotechnology: where to?; designing new molecules and useful materials; evaluating student learning; the influence of national standards; and extending the context for learning through industry links programmes.

For further information, write to ICCE Conference Secretariat (Sally Brown); Continuing Professional Education, The University of Queensland; 4072 Brisbane, Australia.

S&T Education Symposium

The eighth symposium of the International Organization of Science and Technology Education (IOSTE) will take place from 17 to 22 August 1996 in Alberta, Canada.

The symposium will provide an international forum to discuss the latest in science and technology education research, policies and practices. Participants from over fifty countries will explore opportunities to encourage regional co-operation and promote new ideas. The theme of the symposium will be 'Responsible citizenship and economic development' and in keeping with the theme, business and industry will be encouraged to participate with academics and educators.

The sub-themes of the symposium include evidence of the need for, and nature of, science and technology education; policy directions in science and technology education; and promising practices and innovations in science and technology education programmes, assessment practices and technological methods.

For further information, write to 8th IOSTE Symposium, Continuing Professional Education, University of Alberta, 4-116 Education North, Edmonton, Alberta T6G 2G5 Canada.

News from Abroad

International Conference on Chemical Education

The 14th international conference on chemical education is proposed to be held on 14-19 July 1996 at the University of Queensland, Australia. The conference title is 'Chemistry: expanding the boundaries'.

The theme acknowledges the centrality of chemistry through its expanding relationship with many facets of science and everyday life. Conference participants will be called upon to develop this theme with a view to enhancing the understanding of the important relationships which chemistry forms with the new

frontiers of human endeavour. Implications for chemical education beyond 2000 which gives a 'science for all' perspective will be encouraged.

The scientific programme will include discussion of topics such as: implications of research into teaching for chemical education beyond 2000; chemistry: its central purpose in the development of multi-disciplinary approaches to scientific problems; understanding chemistry in the public domain; the influence of technology on the nature of chemistry and chemistry education;

BOOK REVIEW

An Effective Textbook

Malay Dutta*

Rajeev Sangal. LISP Programming. New Delhi, Tata McGraw-Hill Publishing Company Limited, 1995. ISBN 0-07-462396-6, Pp. 231. Rs 120.00.

This well-planned, self-contained textbook can be used to teach programming in LISP to undergraduate and postgraduate students who need not have any special background. The book can also be used by computer professionals in other areas, to learn LISP quickly on their own. LISP is a programming language which is mainly used in Artificial Intelligence (AI) applications. It enforces a style of programming known as the functional style of programming and thus as a programming language it stands apart from the usual procedural languages. This style makes it easier for the programmer to formulate abstract structures quickly and develop large systems much faster and less expensively. Prototypes can be built rapidly with specification and implementation evolving together, with users constantly helping to shape the final result. Therefore every student of Computer Science whether or not he/she is going to specialize in Artificial Intelligence, should be exposed to LISP and its inherent style of programming. High memory requirement was one of the earlier difficulties with LISP. However with the

availability of even desk-top computers with very high amount of memory and other hardware resources, this limitation is now receding. With further developments in LISP or its possible future variants, it is quite possible that LISP-like languages will be put into more and more use in areas other than what are currently considered typical AI areas. In any application programming situation where there is a need of procedure and data abstraction, LISP will turn out ideal as a programming language, and in future it can be hoped that in new application areas in Management and in not-so-numeric sciences like Biotechnology, etc LISP will find considerable use. Contrary to an incorrect belief that LISP is hard to learn, actually since its syntax is very simple, one can very quickly start understanding quite complex programs in LISP. Previous exposure to some other programming languages is not necessary. Also since LISP has been used very heavily in serious and large AI applications, very good programming environments have been developed for LISP which make life much easier for the programmers. Looking at all these, it is somewhat strange that LISP is yet to gain wide popularity except among AI experts. One reason is perhaps that most books on LISP programming have

been somewhat hard to read. A good easily readable textbook on LISP programming is therefore really welcome and Sangal's book provides exactly that.

The book presents the fundamentals of LISP programming with a very lucid style of presentation. The concepts are unfolded in a classroom style with well chosen examples and illuminating exercises avoiding unnecessary and confusing elaborations. Because of this the student can easily master the fundamentals of the language and the functional style of programming, learning perhaps the finer points and details in an accompanying programming project taken up towards the end. In writing the book, the author has made full use of his experience in presenting the contents as a part of the course in AI programming in B.Tech at IIT Kanpur and in two-week intensive courses on AI run at IIT Kanpur. The result is a very fine textbook and because of the potential LISP or similar languages have in future, the book can be readily used in a core advanced programming course in all B.E./B.Tech and M.Sc/MCA courses. For Indian students another advantage is its ready availability and very moderate price. Apart from students, computer professionals in areas other than AI, who have a LISP interpreter available and have no previous experience in LISP, can use this book to get an excellent introduction to programming in LISP and make profitable use of this knowledge in future.

*Professor and Head, Department of Computer Science, Gauhati University, Guwahati-781 014.

THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities

HUMANITIES

Philosophy

1. Dominic, Charles Vas. God, world and soul according to St Thomas Aquinas and Sri Madhvacharya: A comparative study. Bangalore. Dr G A Jaliha, Prof, Department of Philosophy, Bangalore University, Bangalore.

2. Kapoor, Ashish. Modern Indian philosophic thought in relation to our socio political problems with special reference to Swami Vivekanand, Rabindra Nath Tagore, Mahatma Gandhi and Sri Aurobindo. Punjabi. Dr S K Gupta, Department of History, Punjabi University, Patiala.

3. Mukharjee, Jayasree. Analyticity, synonymity and meaning. NBU. Dr C Bhattacharjee, Department of Philosophy, University of North Bengal, Rajarammohunpur, District Darjeeling.

4. Pardeep Kumar. The nature of arguments in Western logic. Punjabi. Dr R D Nirankari, Department of Philosophy, Punjabi University, Patiala.

5. Prasannakumari, V B. The concept of freedom in Marxian ethics. Calicut. Dr V C Narayana Das, Prof and Head, Department of Philosophy, University of Calicut, Calicut.

6. Roychaudhuri, Udaysankar. The nature and function of imagination in Hume and Kant. NBU. Dr P Roy, Reader, Department of Philosophy, University of North Bengal, Rajarammohunpur, District Darjeeling.

Religion

1. Harmail Singh. Bani Shri Guru Ramdas : Srijnataak te darshanik adhyayan. Punjabi. Prof Harminder Singh Kohli, Department of Religious Studies, Punjabi University, Patiala.

2. Kabadgi, Manikamma Sabanna. A socio-cultural study of Ratnakar. Karnatak. Dr R B Raynade, Prof and Head (Retd), Department of Jainology, Karnatak University, Dharwad.

Fine Arts

1. Sethi, Liza. A critical analysis of Elia Kazan's theatrical and cinematic experience. Punjabi. Dr Kamlesh Uppal, Reader, Department of Theatre and Television, Punjabi University, Patiala.

2. Thaman, Kusum. Punjab da Hindi rangmanch : Ik vishleshan. Punjabi. Dr Navnindra Behl, Reader, Department of Theatre and Television, Punjabi University, Patiala.

Music

1. Singh, Purvi. Goswami Tulsidas krit Vinay Patrika ke padon ka rag and ras sambandhi vivechan. Dayanand Rohtak. Dr Bharti Chakraborti.

Language & Literature

English

1. Asha. Social contents in the major plays of John

Osborne. Dayanand Rohtak. Dr S S Sangwan.

2. Bansal, Seema. Images of society in the plays of J B Priestley. Punjabi. Dr G R Kataria, Department of English, Punjabi University, Patiala.

3. Dangwal, Surekha. Hinduism in T S Eliot's works. Garhwal. Prof S S Deo, Hemvati Nandan Bahuguna Garhwal University Campus, Srinagar.

4. Das, Liza. Historical and cultural determinants of women's writing: Studies in selected novels of Doris Lessing and Iris Murdoch. Dibrugarh. Dr (Mrs) T Misra, Reader, Department of English, Dibrugarh University, Dibrugarh.

5. Dhir, Sangeeta. William Dean Howells and the rise of realism in American fiction. Punjabi. Dr G S Rahi, Department of English, Punjabi University, Patiala.

6. Dutt, P Kiranmai. EFB : A need-based course for commerce students and professionals. Osmania. Prof N R Shastri, Department of English, Osmania University, Hyderabad.

7. Joseph, M Asha. Narrative techniques as camouflage in the writings of Emily Bronte: A feminist reading. Calicut. Dr Sankaran Ravindran, Prof and Head, Department of English, University of Calicut Centre, Talassery.

8. Kamlesh Rani. Social realism in the short stories of Mulk Raj Anand. Kurukshetra.

9. Karmarkar, P Rajendra. The idea of loyalty to the earth in the major novels of Camus: A selective study. Andhra.

10. Narasimhan, Uma. Myth and legend in Indian writing in English. Bangalore. Dr C N Srinath, Department of English, Bangalore University, Bangalore.

11. Sodhi, Praramjit Kaur. Solitude in society: A study of character relationships in the novels of Joyce Carol Oates. Punjabi. Dr Kum Kum Bajaj, Department of Correspondence Courses, Punjabi University, Patiala.

Sanskrit

1. Ashwani Kumar. Paimplad Samhita: Ek anusheelan. HP.

2. Chaturvedi, Girdhari Lal. Re-visiting Sakuntalam: A commentary on Goethe's Sakuntala Epigram. D Litt. Durgavati. Prof K K Chaturvedi, Head, Department of Sanskrit, Rani Durvavati Vishwavidyalaya, Jabalpur.

3. Dwivedi, Pramod Kumar. Ban Bhatt ke kritiyon mein chitrit Bharatvarsh: Ek vishleshanatmak adhyayan. Bundelkhand. Dr Jagdev Prasad Pandey, Attara College, Attara.

4. Jagdish Chand. Madhyandin Samhita mein pratipadit dharam evam pratibimbik samaj. HP.

5. Khanduri, Arvind. Natyadarpan evam Natak

Chandrika ka tulnatmak adhyayan. Garhwal. Dr J K Godiyal, Hemwati Nandan Bahuguna Garhwal University Campus, Srinagar.

6. Mitra, Teju. **Patanjal Mahabhashya evam Kshikavritii ka tulnatmakadhyayan.** Garhwal. Dr Girija Sankar, D A V Post Graduate College, Dehradun.

7. Raheja, Promila. **Mahakavi Vasant Trayambak Savde ke Sanskrit mahakavyon ka sameekshatmak adhyayan.** Dayanand Rohtak. Dr S K Bhardwaj.

8. Sadhna Kumari. **Art of characterization in Balmikis Ramayana.** AMU Prof S P Singh.

9. Sharma, Sudha. **Dharmasutro mein rajadharma tatha nyaya-vyavastha.** Dayanand Rohtak. Dr Manjul Gupta.

10. Shreedhar. **Pramukh puranon ke sandarbh mein rashtre evam rashtriya bhavana.** Bundelkhand. Dr Gadadhar Tripathi, Head, Department of Sanskrit, Shri Agrasen College, Mauranipur

11. Uniyal, Guna Nand. **Darshnik pariprekshya mein adhyatma Ramayan ka anusheelan.** Garhwal. Dr Harish Chandra, D A V Post Graduate College, Dehradun.

Punjabi

1. Baljinder Singh. **Sardar Kapoor Singh dee Punjabi vartak : Ik mulyankan.** Punjabi. Dr Gurdev Singh, Department of Punjabi, Punjabi University, Patiala.

2. Balwinder Singh Harbhajan Singh dee alochana vidhi. Punjabi. Dr Narinder Pal Singh Kapoor, Lecturer, Department of Hindi, Punjabi University, Patiala.

3. Jaspal Singh. **Adhunik Punjabi kavita vich sabhiyacharak rupantaran, 1960-85.** Punjabi. Dr Narinder Singh Kapoor, Department of Punjabi, Punjabi University, Patiala.

4. Urmil Rani. **The semiotic structure of the rites of passage in Punjabi society.** Punjabi. Dr Surjit Singh, Department of Linguistics, Punjabi University, Patiala.

Hindi

1. Bali, Kamini. **Samkaleen upanyasik paridrishya aur Mridula Garg ke upanyas.** Garhwal. Dr S C Sharma, M P G College, Mussoorie.

2. Bhadoria, Kaushalendra Singh. **Prasadottar Hindi mahakavya: Shastriya vishleshan.** D Litt Bundelkhand.

3. Bhatt, Asha. **Bhartiya swatantrata sangram ko Hindi kaviyon ke den.** Garhwal. Dr Madhu Sharma, K M P Post Graduate College, Dehradun.

4. Chandrika, K. **A study of socio-religious views of Tulsidas and Gandhiji in the field of education.** Calicut. Dr Iqbal Ahmad, Prof, Department of Hindi, University of Calicut, Calicut.

5. Dabral, Meena. **Vrindavan Lal Varma ke upanyason mein nari patra.** Garhwal. Dr Saroj Tripathi, K M P Post Graduate College, Dehradun.

6. Damor, Sharmila. **Malwa ke pratinidhi kahanika aur**

sathottar Hindi kahani. Devi Ahilya, Dr Ramesh Soni, 4 Vardhman Apartment, Old Palasia, Indore.

7. Daulat Ram. **Sathottary kavita mein bhasha prayog.** Punjabi. Dr Nav Rattan Kapoor, Department of Hindi, Govt Mahendra College, Patiala.

8. Gupta, Jai Shankar Lal. **Hindi se Rossi aur Rossi se Hindi mein anudit katha sahitya ka tulnatmak adhyayan.** JNU. Dr S P Sudhesh, Centre of Indian Languages, Jawaharlal Nehru University, New Delhi.

9. Gupta, Sudesh. **Hindi charit kavyon ke parampara mein Punjabi mein upalabdh charit kavyon ka alochanatmak adhyayan.** Punjabi. Dr Narinder Pal Singh Kapoor, Lecturer, Department of Hindi, Department of Correspondence Courses, Punjabi University, Patiala.

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Assamese

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Manipuri

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Nepali

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Centre for Women Studies and Development-1: post tenable upto March 31, 1997 (likely to continue).

15% posts of Lecturers will be reserved for members of Scheduled Castes and 7-1/2 % for members of Scheduled Tribes but these will be treated as unreserved if no suitable Scheduled Caste/Scheduled Tribe applicant is available.

Application form alongwith 'Detailed Instructions' can be had either from Cashier, Panjab University, on payment of Rs.75/- for General Category and Rs.30/- for SC/ST candidates or from Deputy Registrar(Estt.) by sending a Crossed A/c Payee Bank Draft payable at Chandigarh, of same amount in favour of Registrar, Panjab University, Chandigarh, accompanied by a self-addressed stamped (worth Rs.8/-) envelope of 30cm x 12cm.

Candidates abroad may apply on plain paper with full bio-data (eight copies) together with a fee of Rs.75/- payable by a Crossed A/c Payee Bank Draft payable at Chandigarh, in favour of Registrar, Panjab University, Chandigarh.

ues. If the post is dereserved subsequently, a general category candidate selected on a temporary basis may be considered for regularisation. If suitable candidates with NET/SET/JRF may be considered. If selected they must pass NET/SET/JRF within specified period.

The University reserves the right to prepare panels of suitable candidates for appointment against vacancies occurring within a period of one and a half years from the date of the meeting the respective Selection Committees. It will be open to the University to consider the names of suitable candidates who may not have applied in response to the advertisement but are otherwise qualified and considered suitable. Canvassing in any form by or on behalf of the candidates will disqualify him/her. The University reserves the right not to fill up any or all posts advertised.

Prof. K.M. Mathew
REGISTRAR

Dempo Charities Trust
DHEMPE COLLEGE OF ARTS
& SCIENCE

P.O. BOX 222, PANAJI-GOA - 403 001

CORRIGENDUM

This refers to the advertisement published in *University News* Issue dated 27 May 96. The post under Sr. No. 8 - LIBRARIAN (Full-time) should be read as for general category and NOT RESERVED FOR SC

Applications, complete in all respects, should reach the Principal within 15 days from the date of publication of this advertisement.

Date: 28-5-96. **Dr. G.N. Mishra**
PRINCIPAL

SARDAR VALLABHBHAI
REGIONAL COLLEGE OF
ENGINEERING &
TECHNOLOGY

SURAT-395 007

Applications are invited separately for each of the following permanent posts by 2nd July, 1996 in the prescribed form, which can be had on payment of Rs. 50/- for all open category and Rs. 2/- for S.C./S.T./O.B.C. category belonging to Gujarat State only (on production of Caste Certificate) by a Crossed Indian Postal Order/or Crossed Demand Draft drawn in favour of

"Principal, S.V.R. College of Engg. & Tech., Surat." The Demand Draft be made payable at State Bank of India, S.V.R.C.E.T. Branch, Surat, Code No 3320. A self addressed envelope of 23 cms x 10 cms. size should be sent. Details regarding prescribed qualifications, experience etc. will be furnished alongwith the Application Form.

A TEACHING POSTS :

(1) DEPARTMENT OF ELECTRONICS ENGINEERING :

- 1 Professor of Computer Engineering — Open, One post. Computer Processors/ Algorithm and data structure/ Computer Aided Design and Computer Graphics/Computer Networking and Data Communication/Software Engg./Artificial Intelligence expert System etc.
- 2 Lecturer in Computer Engineering — Open, One Post 1st Class Bachelor's Degree in Computer Engineering

(2) DEPARTMENT OF APPLIED MECHANICS :

- 1 Professor — Open, Two Posts (One post is permanent and one post is temporary but likely to be permanent) Advanced Structural Analysis/Structural Dynamics Computer Methods in Structural Engg./Structural Design (RCC & Steel Structures) Soil Mechanics & Foundation Engg./Geotechnical Engg.

(3) DEPARTMENT OF CIVIL ENGINEERING :

- 1 Professor — Open, Two Posts.
1 Post - Town Planning and Housing
1 Post - Environmental Engg.

(4) DEPARTMENT OF MECHANICAL ENGINEERING :

1. Lecturer — Open, One Post. 1st Class Bachelor Degree in Mechanical Engineering.

(5) DEPARTMENT OF CHEMICAL ENGINEERING :

1. Professor — Open, One Post (Temporary but likely to be permanent) — Chemical Engg.
2. Asstt. Professor — Open, Two Posts (Temporary but likely to be permanent). Chemical Engg.
3. Lecturer — Open, One Post. 1st Class Bachelor's Degree in Chemical Engg.

(6) DEPARTMENT OF APPLIED SC. & HUMANITIES :

1. Lecturer in Chemistry — Open, One Post. 1st Class Master's Degree in Organic Chemistry.

PAY SCALES .

1. Professor : Rs. 4500-150-5700-200-7300
2. Asstt. Professor : Rs. 3700-125-4950-150-5700
3. Lecturer : Rs. 2200-75-2800-100-4000

PRINCIPAL

GVM

INSTITUTE OF ADVANCED STUDIES IN EDUCATION

SARDARSHAHR,

RAJASTHAN, 331401.

(Gandhi Vidya Mandir is an Educational Complex spread over 1190 acres of land and running institutions from pre-primary to postgraduate and research level and serving the nearby 100 villages with a holistic approach of all round development of rural areas. It is serving in the field of education, rural development, social welfare and educational research since 1950. It was founded as a first rural Institute of India by the first President of India on 28th August 1955 and IASE is affiliated to MDS University, Ajmer)

REQUIRES

1. Professors : 01 (Educational Psychology): M.A./M.Com./M.Sc. and good second class M.Ed. with doctorate degree in Education/Psychology, 10 yrs experience of teaching/research, out of which 5 years of teaching M Ed. class/

Rashtriya Sanskrit Vidyapeetha
(Deemed University)
Tirupati - 517 507

Applications are invited from Indian citizens for the following posts in the Vidyapeetha so as to be received by the undersigned on or before 5.00 p.m. on 5th July, 1996.

- 1 Reader (Pedagogy) 2 Posts
(One regular and one temporary in the Pay scale of Rs. 3700-5700)
 - 2 Lecturer (Pedagogy) 1 Post
(Reserved for SC) (Rs 2200-4000)
 3. Junior Personal Assistant : 1 Post
(Reserved for SC) (Rs 1400-2300)
- Prescribed application forms along with details of Qualifications etc, can be obtained from the undersigned by sending a self-addressed stamped envelope of 29 cms X 12½ cms affixing Rs 2 00 postage stamps along with a Demand Draft drawn in favour of the Registrar for Rs. 50.00 for Readers (for SC/ST Rs. 20.00) and Rs. 10/- for Lecturers (SC) and Junior P A. (SC).

The Readers and Lecturers are expected to teach in Sanskrit medium.

Separate application form is required for each post. SC/ST candidates should enclose a copy of the Caste Certificate.

REGISTRAR

Supervising Ph.D scholars. Specialization in Educational Psychology and teaching of the subject is essential.

2. **Reader : 02;** Educational Planning & Management (01), Social Science (1) M.A./M.Sc./M.Com. (55%); M.Ed. (55%), Ph.D. in Education/Social Science (Only for the post of Reader in Social Science), with five years experience of teaching out of which three years as a lecturer in Education. Specialization in Educational Management at M.Ed./Ph.D. level for post No. 1 and experience of teaching Social Science at B.Ed./M.Ed. level for post No. 2 is essential. Persons with M.Ed. teaching Experience will be preferred.

3. **Lecturers : 09;** One each in 1) English, 2) Hindi, 3) Economics, 4) Home-Science, 5) Chemistry, 6) Physics/Mathematics, 7) Psycho-Socio Foundation of Education, 8) Educational Technology (With specialization in Computer Science), 9) NFE & Adult Education. For post No. 1-6, good second class M.A./M.Sc./M.Com. in relevant subject along with M.Ed. (C; in seven point Scale). Post No. 7-9 the essential Qualifications remain the same as given for the post No. 1-6. For post No. 7 person possessing M.A. in Pol. Science/Psychology will be preferred. For post No. 8 person possessing P.G. diploma in Computer Science will be preferred. For post No. 9 person possessing experience in the field of NFE & Adult Education or Specialization in the field will be preferred. Person possessing M.Phil./Ph.D. degree/teaching experience of B.Ed./M.Ed. Classes will be preferred. For the post of lecturer in Educational Technology the qualification B.Ed./M.Ed. may be relaxed by the selection committee.

4. **Craft Teacher: 02;** Physical Education (1), S.U.P.W. (1) For post No. 1; M.A./M.Sc./M.Com. with B.P.Ed. (good second class) and specialization in Yoga. For the post No. 2; M.A./M.Sc./M.Com. with P.G. Diploma in Computer Science. B.A./B.Sc./B.Com. with P.G. Diploma in Computer Science can also apply. Candidate with teaching experience as computer Instructor will be preferred.

5. **Steno/Typist: 01;** Hr. Secondary/Sr. Secondary with speed of shorthand 100:120 respectively in Hindi & English and 25:40 words per minute speed of typing in Hindi & English respectively is essential.

6. **Gardener : 01,** Vth Standard with cer-

tificate/experience in gardening.

Note:-

1. Salary and other allowances as per Rajasthan Govt. rules applicable to aided institutions.
2. Application form with full details of qualifications and the pay scales can be obtained from the Registrar, Gandhi Vidya Mandir, Sardarshahar by sending a crossed postal order/bank draft of Rs. 100/- alongwith a self addressed envelope (with Rs. 10/- Postal Stamp).

3. Applications with full Bio-data neatly typed on plain paper along with a crossed Indian Postal Order/Bank Draft of Rs. 100/- payable in favour of Registrar, Gandhi Vidya Mandir can also be considered.

4. Last date & time for receipt of complete application in all respects at the office of the Registrar is 30th June 1996 at 1200 Hrs.

REGISTRAR

WALCHAND COLLEGE OF ENGINEERING, VISHRAMBAG, SANGLI

Applications in the prescribed forms are invited for the full time posts mentioned below so as to reach the office of the Principal within 30 days from the date of this advertisement.

#DEGREE WING#

| S.No. | Department | Professor Open : Reserved | Asstt. Professor Open : Reserved | Lecturer Open: Reserved |
|-------|------------------------------|------------------------------|-------------------------------------|----------------------------|
| 1) | Civil | - | - | 1 ST(I)+ |
| 2) | Mechanical | - | 1 ST(VI) | 1 SC(I) |
| 3) | Electrical | - | - | 1+ |
| 4) | Computer | 1 | 1 SC(VI) | 1 ST(II) |
| 5) | Applied Mech. | - | 1 SC(VI) | - |
| 6) | Mathematics | - | - | 1 SC(I) |
| 7) | Geology | - | - | 1 |
| 8) | Training & Placement Officer | - | 1 OPEN | - |

* DIPLOMA WING *

| | | | | |
|----|----------------------------|--------|---|--------------------------|
| 1) | Vice-Principal (Poly.Wing) | 1 Open | | |
| 2) | Electrical | - | - | 1+ 1 ST (IV) 1 SC (I) |
| 3) | Applied Mech. | - | - | 1 SC (I) |

NOTE :-

- 1) Roman figures in the brackets show time of advertisement, '+' shows the temporary post against lien post. The vacancy is likely to continue on vacation of the lien. '#' shows post meant for Metallurgy.
- 2) i) The reserved posts advertised upto Vth times will be filled in by particular reserved category only.
ii) The reserved posts advertised for more than Vth times will be filled in by transferring the categories internally as per the provisions in the G.R.No. BCC-1094/CR-57/94-16B dated 5.12.94 if the candidates from the particular categories are not available i.e. SC to ST or ST to SC.
- 3) If B.C. candidates as stated in (2) above are not available then other candidates will be considered for appointments for six months only.
- 4) Backward Class candidates who are domiciled out of Maharashtra State

will be treated as Open.

- 5) Backward Class candidates applying for the reserved posts should send a copy of their application to the Special Cell of Shivaji University, Kolhapur, as far as DEGREE POSTS are concerned.
- 6) Educational qualifications, pay scales, and service conditions will be as per the rules of Shivaji University, Kolhapur, as far as Degree posts are concerned, and for Diploma posts, as per directives of The Director of Technical Education, M.S. Bombay.
- 7) The details of qualifications, experience, pay scales and other conditions etc for the post and prescribed application form can be had from the College office personally or by post sending self addressed envelope size 10 cms x 25 cms with stamps of Rs. 2/- duly fixed.
- 8) The reserved posts are advertised under "Special Recruitment Drive".

Date: 28.5.1996

PRINCIPAL

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